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Changing Market Conditions: Implications for Ohio Dairy Marketing Cooperatives

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FOREWORD

The objective of this study is to analyze market factors which affect and are likely to affect producer members of dairy cooperatives in Ohio. Concern is focused on cooperatives as they represent producers rather than separate economic institutions. The present report is an effort to provide dairy producers and the leadership of their cooperatives with a considered basis for long-run plans and policies with respect to the marketing of fluid milk. This is effected through the presentation and general interpretation of significant basic data.

The substance of this report was presented to the Board of Directors of The Ohio Milk Producers' Federation at their meeting, October 14, 1963. Appreciation is expressed to the members of this board for their helpful comments. Special thanks are extended to Roy Benson, Manager, Northwest Cooperative Sales Corporation; Dean Dowler, Manager, Southeastern Ohio Cooperative Milk Producers; Leonard Lowmiller, member of the Board of Directors, Stark County Milk Producers Association. W. T. Osborne, Secretary-Treasurer, Cincinnati Milk Sales Association, Donald E. Zehr, Manager, Central Ohio Cooperative Milk Producers, Inc., and Glen Wagner (*ex officio*) Secretary Ohio Milk Producers Federation, members of the Market Study Committee of The Ohio Milk Producers Federation. Thanks are also extended to W. K. Brandt, Undergraduate, The Ohio State University, Department of Agricultural Economics and Rural Sociology, for his assistance in assembling the data for this report.

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INTRODUCTION

An increasing number of market strains have been experienced by individual dairy cooperatives in Ohio. Concern has been expressed regarding the adequacy of the present arrangement of cooperatives for achieving the objective of increased returns to dairy producers. The current structural organization of milk marketing cooperatives might not be the most effective, or even adequate, in light of the many changes made by the dairy industry in recent years. In this regard it might be helpful to briefly review some background information and to indicate some of the specific problems and questions facing Ohio milk producers and milk marketing cooperatives.

BACKGROUND

Milk marketing in Ohio was developed largely on the basis of individual population centers which formed separate milk markets. Due to the relatively poor transportation and communication systems of the past, those responsible for milk marketing (including producers, processors and distributors), found it unnecessary to concern themselves with developments in neighboring markets. Each major metropolitan area had its own milk marketing cooperative or cooperatives. These organizations developed programs for the benefit of the producers in the market that they served. Due to

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market isolation, milk processing and distribution were handled in much the same manner. Large dairy companies operated processing facilities in each population center which they served.

Each market developed and enforced certain health regulations that served to further isolate city markets. Active enforcement of these regulations often made it impossible to move milk among markets even if there were no physical barriers.

The individual market approach was also evident in the marketing programs of this period. Programs such as seasonal incentive plans, classified pricing, market audits, and advertising and promotion were in effect in some markets, but not in others. The Marketing Agreement Act of 1937 recognized these market differences and marketing orders were established on this basis. It was the objective of this program to disrupt these local market programs as little as possible. As a result, many significant differences still prevail in the federal order programs of neighboring markets. Such differences frequently leave economic consequences that contribute to some of the problems fared by the dairy industry today.

RECENT DEVELOPMENTS

During the last twenty years many significant developments have shaken the very foundations of the isolated milk market. Some of the major items that deserve mention include: (a) improved communication systems for producers, processors, and consumers; (b) improved highway and milk transportation systems; (c) the development of more uniform health regulations; (d) the development of new containers; (e) increased sales through retail

stores; and (f) new technology in the processing of dairy products. Each of these factors has been instrumental in broadening the geographical concept of a "milk market."

Research studies indicate that substantial reductions in unit costs are possible through large scale processing facilities. In Ohio, there are a number of firms which have consolidated several relatively small local processing facilities into larger centralized operations. The expected scale economies outweigh the increased transportation costs associated with such consolidations. Now these firms ship a large volume of packaged milk and milk products from one metropolitan area to another. In some instances, products have moved into markets having a lower raw product price than that in the shipping market. The bases for this type of product movement are the long-run plans of the firm and the efficiency of the processing operation relative to the combined procurement and transportation costs.

The following questions are considered in this analysis.

1. Would a coordinated milk marketing program in Ohio, which facilitated the inter-market movements of milk, permit the seasonal and weekly shortages and surplus of Grade A milk to be handled more efficiently thereby increasing returns to Ohio milk producers?

2. Would changes in the federal order marketing programs in the Ohio markets enhance producer returns and provide a more orderly system for the marketing of milk?

3. With the many developments in milk marketing, what now constitutes definable milk marketing areas in Ohio?

4. Does the cooperative structure currently in existence meet the needs of producers in today's markets? This issue has many ramifications which are vital to the activities and programs of dairy cooperatives in Ohio. For example, is it possible to expand the activities of present cooperatives and yet maintain effective membership support? Also, can cooperatives perform membership services more efficiently under a new structure?

I

Population

Success in the dairy industry ultimately depends on the nature of markets for its end products. The aspects of markets important to producers include the number and location of consumers, as well as the distribution of these consumers with respect to income, race, education, age, etc. For purposes of this analysis, it is assumed that the chief indicators of markets for milk and milk products are the size and location of future population. While other factors may change over time it is virtually impossible to predict the intensity or direction of this influence on demand. Further, sellers must be aware of shifts in the location of population as they represent increased or decreased market opportunities.

The Ohio Department of Industrial and Economic Development has predicted a population increase for Ohio of about 1/3 from 1962 to 1980. As shown in Figure 1, this is represented by an increase from 10,104,000 people in 1962 to 13,353,000 people in 1980. This indicates a substantial increase in the market potential for milk and milk products.

Figure I indicates that there will continue to be considerable variation in the number of people per county. In all counties, excepting 7 in the Southeastern area, increases in total population are projected. The major population centers and urbanized areas are far more important in terms of demand than are individual counties. Tables 1 and 2 indicate the expected growth in these areas. Table 1 shows that the heavily populated counties of today will continue to represent about the same per cent of the total population. In Table 2 the population of four urbanized areas of Ohio is estimated. These areas will grow at about the same rate as the state and therefore make up about the same per cent of the total population.

Future patterns in population distribution are likely to be a continuation of the patterns noted in the 1950's (See Table 3[1/]). The increasing density of population in the suburban areas of central cities and the continued expansion of these regions is likely to make it difficult to define individual metropolitan areas. In addition to the metropolitan areas noted in Tables 3 and 4, Ohio is surrounded by a number of major metropolitan areas. To some extent the populations found in these areas represent additional market opportunities.

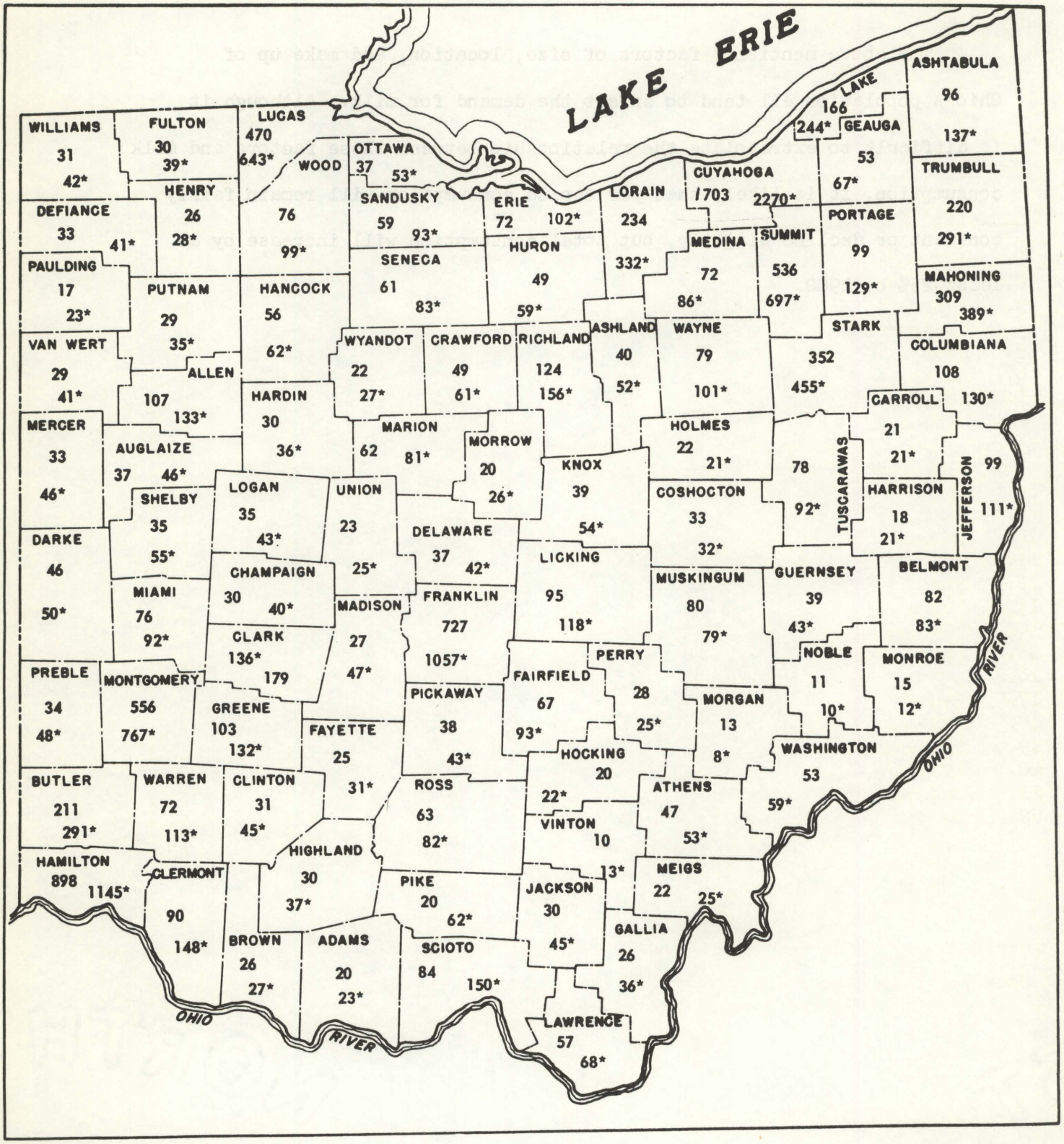
Other chracteristics of the Ohio population also warrant consideration in analysis of the market potential for milk and milk products. In 1950, 70.2% of the population lived in urban areas. By 1960, this percentage had risen to 73.4. Past observation indicates that urban people consume less milk per capita than do rural people. The continued growth of urbanization is likely to result in a declining per capita consumption. There has also been a shift in the make up of the population. For example, the Negro population increased from 6.5% of the total in 1950 to 8.1% in 1960. As a general rule, the per capita consumption of Negroes is somewhat lower than that of the white population. On the other hand, the median family income in Ohio rose from $3629 in 1950 to $6171 in 1960. Also during this period, the median age of the Ohio population dropped from 31.2 years to 29.5 years. A continuation of these trends would likely favor increased consumption per capita.

1/ Table IV also gives data referring to the population of metropolitan areas. Differences between these tables are due to the area definitions on which population estimates are based.

The above mentioned factors of size, location, and make up of Ohio's population all tend to affect the demand for milk. Although it is difficult to extrapolate the relationship between these factors and milk consumption, it is likely that per capita consumption will remain fairly constant or decline slightly, but total consumption will increase by at least 25% by 1980.

FIGURE 1

ESTIMATES OF PRESENT AND PROJECTED POPULATION OF
OHIO BY COUNTIES, 1962 AND 1980



Total Ohio Population
(thousands)

1962 - 10,104

1980 - 13,353*

*1980 population estimate
in thousands

Source: Ohio Population Growth and Distribution: State of Ohio, Department of Industry and Economic Development, 1960.

Table 1

Estimates of Present and Projected Population of the Twenty-two Most Populous Ohio Counties, 1962 and 1980 and the Percentage Change

	County	1962 (thousands)	1980 (thousands)	Percentage Increase
1.	Cuyahoga	1703	2270	33.3%
2.	Hamilton	898	1145	27.5
3.	Franklin	727	1057	45.5
4.	Montgomery	556	767	37.9
5.	Summit	536	697	30.0
6.	Lucas	470	643	36.8
7.	Stark	352	455	29.3
8.	Mahoning	309	389	25.9
	Total (eight most populous counties)	5551	7423	33.7%
	Percent of total Ohio population	54.9%	55.6%	
9.	Lorain	234	332	41.9%
10.	Trumbull	220	291	32.3
11.	Butler	211	291	37.9
12.	Lake	166	244	47.0
13.	Clark	136	179	31.6
14.	Richland	124	156	25.8
15.	Columbiana	108	130	20.4
16.	Allen	107	133	24.3
17.	Greene	103	132	28.2
18.	Portage	99	129	30.0
19.	Jefferson	99	111	12.1
20.	Ashtabula	96	137	42.7
21.	Licking	95	118	24.2
22.	Clermont	90	148	64.4
	Total (twenty-two most populous counties)	7439	9954	33.8%
	Percent of total Ohio population	73.6%	74.6%	
	Total Ohio population	10,104	13,353	

Source: Ohio Population Growth and Distribution: State of Ohio, Department of Industry and Economic Development, 1960.

Table 2

Estimates of Present and Projected Population of Four Urbanized Ohio Areas, 1962 and 1980 and the Percentage Change

Urbanized Area and County	1962 (thousands)	1980 (thousands)	Percentage Increase
A. Northeastern Ohio:			
1. Cuyahoga	1703	2270	33.3%
2. Summit	536	697	30.0
3. Stark	352	455	29.3
4. Mahoning	309	389	25.9
5. Lorain	234	332	41.9
6. Trumbull	220	291	32.3
7. Lake	166	244	47.0
8. Columbiana	108	130	20.4
9. Portage	99	129	30.0
10. Ashtabula	96	137	42.7
11. Medina	72	86	19.4
12. Geauga	53	67	26.4
Total	3948	5227	32.4%
Percent of Ohio Population	39.1%	39.1%	
B. Northwestern Ohio:			
1. Lucas	470	643	36.8%
2. Wood	76	99	30.3
3. Erie	72	102	41.7
4. Sandusky	59	93	57.6
5. Ottawa	37	53	43.2
Total	714	990	38.7%
Percent of Ohio Population	7.1%	7.4%	
C. Central Ohio:			
1. Franklin	727	1057	45.4%
2. Licking	95	118	24.2
3. Fairfield	67	93	38.8
4. Pickaway	38	43	13.2
5. Delaware	37	42	13.5
6. Madison	27	47	74.1
7. Union	23	25	8.9
Total	1014	1425	40.5%
Percent of Ohio Population	10.0%	10.7%	

Table 2 (cont.)

Urbanized Area and County	1962 (thousands)	1980 (thousands)	Percentage Increase
D. Southwestern Ohio:			
1. Hamilton	898	1145	27.5%
2. Montgomery	556	767	37.9
3. Butler	211	291	37.9
4. Clark	136	179	31.6
5. Greene	103	132	28.2
6. Clermont	90	148	64.4
7. Miami	76	92	21.0
8. Warren	72	113	56.9
9. Preble	34	48	41.2
Total	2176	2915	34.0%
Percent of Ohio Population	21.5%	21.8%	
Total (four areas)	7852	10,557	
Percent of Ohio Population	77.7%	79.1%	

Source: Ohio Population Growth and Distribution: State of Ohio, Department of Industry and Economic Development, 1960.

Table 3

Population of Major Ohio Standard Metropolitan Areas [1]
1950, 1960 and Percentage Change

Metropolitan Area	1950	1960	Percentage Increase
Akron	410,032	513,569	25.3%
Canton	283,194	340,345	20.2
Cincinnati	904,402	1,071,624	18.5
Cleveland	1,465,511	1,796,595	22.6
Columbus	503,410	682,962	35.7
Dayton	518,642	694,623	33.9
Hamilton-Middletown	147,203	199,076	35.2
Huntington-Ashland (W. Va.-Ky.-Ohio)	245,795	257,780	4.9
Lima	88,183	103,691	17.6
Lorain-Elyria	148,162	217,500	46.8
Springfield	111,661	131,440	17.7
Toledo	395,551	456,931	15.5
Wheeling-Steubenville (W.Va.-Ohio)	354,092	358,098	1.1
Youngstown-Warren	416,544	509,006	22.2
Total-Metropolitan Areas	5,992,382	7,333,240	

[1] As defined at time of census.

Source: U. S. Census of Population

Table 4

Population of Selected Federa Order Milk Marketing Areas, 1960 Census by Market and State January 1, 1962

Marketing Area	State	Population By State	Population Total
Cincinnati	Ohio	1,209,438	
	Kentucky	262,604	1,472,042
Columbus	Ohio		816,532
Dayton - Springfield	Ohio		607,005
North Central Ohio	Ohio		311, 647
Northeastern Ohio	Ohio		2,935,914
Toledo	Ohio	548,185	
	Michigan	90,595	638,780
Tri-State	Kentucky	251,680	
	Ohio	313,762	
	West Virginia	240,119	805,561
Wheeling	Ohio	265,124	
	West Virginia	175,033	440,157
Youngstown - Warren	Ohio		515,592

Source: Milk Marketing Areas Under Federal Orders With Population Data, U.S.D.A., Agricultural Marketing Service, Milk Marketing Orders Division, June, 1963

II

Production and Producers

Characteristics of the Ohio Crop Reporting Districts

Since many of the data presented in this report are geographically founded in crop reporting districts, an understanding of their characteristics should lend meaningfulness to these data. Figure 2 locates the various crop reporting districts in Ohio.

Tables 6 and 7 show that there is considerable variation in the productivity (using corn yield as an example) and the amount of tillable acres in these districts. This will have a definite bearing on the alternatives available to farmers in these districts.

Table 8 indicates that over the past 12 years, the western districts have experienced a decrease in the percent of cash receipts derived from the dairy enterprise, whereas the eastern and northeastern sections have been more stable in this respect. Table 8 further shows the relative position of the more important farm enterprises in terms of cash receipts.

Figure 3 shows that a rather wide variation exists among Ohio counties in the absolute level of cash receipts from dairy products. Some of this variation is due to heavy urbanization in several counties.

FIGURE 2

OHIO CROP REPORTING DISTRICTS

1. Northwest
2. North Central
3. Northeast
4. West Central
5. Central
6. East Central
7. Southwest
8. South Central
9. Southeast

Source: Ohio Crop Reporting Service

Table 6

Per Cent of Acres Tillable by Crop Reporting District, 1958

Northwest	82.2%
North Central	69.4
Northeast	45.3
West Central	75.1
Central	64.2
East Central	27.5
Southwest	59.9
South Central	34.2
Southeast	20.6

Source: Ohio Soil and Water Conservation Needs Inventory, 1961.

Table 7

Production of Corn Per Acre by Crop Reporting District in Ohio, 1950, 1956, 1962

District	1950 (bu)	1956 (bu)	1962 (bu)
Northwest	50.7	61.0	78.0
North Central	48.6	55.5	75.1
Northeast	44.2	42.5	68.4
West Central	56.7	64.5	79.8
Central	56.3	62.6	75.2
East Central	47.8	50.0	64.7
Southwest	56.3	66.5	80.0
South Central	45.1	60.5	72.1
Southeast	45.0	54.0	61.3
State	52.0	60.0	76.0

Source: Ohio Agricultural Statistics.

Table 8

Per Cent of Cash Receipts from Selected Farm Products
1950, 1956, 1962

Crop Reporting District		Dairy	Meat	Poultry	Grain	Fruits, Vegetables Nursery
Northwest	1950	17%	17%	15%	33%	---
	1956	13	19	11	43	4%
	1962	8	26	9	41	6
North Central	1950	25	24	11	19	---
	1956	22	17	9	34	5
	1962	19	24	6	31	8
Northeast	1950	40	7	18	4	18
	1956	43	8	13	6	22
	1962	36	13	10	3	30
West Central	1950	25	30	14	17	---
	1956	24	24	11	35	---
	1962	20	30	10	31	2
Central	1950	25	41	9	12	---
	1956	22	37	8	28	---
	1962	18	41	6	27	---
East Central	1950	43	23	18	6	---
	1956	43	22	17	7	2
	1962	40	31	13	5	5
Southwest	1950	21	48	8	7	6
	1956	21	39	7	15	8
	1962	15	46	6	17	6
South Central	1950	28	31	13	5	---
	1956	25	24	13	13	2
	1962	22	31	9	11	---
Southeast	1950	40	31	17	3	---
	1956	36	28	18	8	3
	1962	31	38	11	2	6
All State	1950	28	28	13	13	---
	1956	25	23	11	26	5
	1962	21	30	8	24	4

Source: Ohio Farm Income, Ohio Agricultural Experiment Station, 1950, 1956, 1962.

FIGURE 3

CLASSIFICATION OF OHIO COUNTIES ACCORDING TO LEVELS

OF CASH RECEIPTS FROM SALE OF DAIRY PRODUCTS, 1961

Less than $1,000,000

$1,000,000 to $1,999,999

$2,000,000 to $2,999,999

$3,000,000 and over

Source: Ohio Farm Income, (Wooster, Ohio, Ohio Agricultural Experiment Station, 1961)

Number of Producers

With one exception (Noble), every county experienced a numerical reduction of milk producers from 1949 to 1959. The most significant decrease (68.7%) took place in the northwest section of the state, while the smallest decreases are noted in the three southeastern districts where producer numbers have been historically low. The entire state experienced a decrease of 44.5% during this period. These data are presented in Figure 4 and Table 9.

One means of predicting producer numbers is through extrapolation of turnover by Markov chains.[2/] This device assumes that those factors which have influenced producer turnover during some past period will have the same effect on future turnover. This method of analysis was employed in Fulton county to determine producer numbers over an extended period of time. Table 10 indicates that by 1977 an additional decrease of 1/3 can be expected. Similar work was done in regard to the Columbus market. In this case, it was found that 86% of the dairy farmers producing 7,000 - 10,000 pounds of milk per month in 1960 will not be producing milk for the Columbus market by 1975.[3/]

These analyses suggest that the rate of producer turnover in Ohio is relatively high. As shown in Table 11, the number of farms producing milk for manufacturing purposes declined much more than the number of farms producing milk for fluid use. The number of producers marketing milk at fluid markets dropped 11,000 while the number of producers selling milk to manufacturing plants dropped by 29,000. This means a net reduction of 40,000 producers between 1948 and 1962, approximately 48%.

2/ A discussion of Markov chains may be found in Introduction to Finite Mathematics by J.G. Kemeny, J.L. Snell, and G.L. Thompson (Englewood Cliffs, N. J.: Prentice Hall, Inc., 1957) pp. 171-175.

3/ Padberg, D.I., "Dynamics of Ohio Dairy Producers," Government and Marketing, Proceedings of the Fourth Annual Agricultural Marketing Conference, Ohio State University, March 15, 1962, A.E. 333 (Columbus, Ohio, Department of Agricultural Economics and Rural Sociology, The Ohio State University, 1962) pp. 46-61.

Figure 5 shows the degree of overlap in the procurement areas of Ohio Federal Order markets. More specific data is presented in Table 12. These data show the various markets to which the producers in individual counties are shipping milk. Table 13 shows the number of producers shipping milk into Ohio Federal Order markets from neighboring states. Ohio markets are served by 5207 out of state producers, compared to 14,562 Ohio producers. With the exception of Columbus, all Ohio Federal Order markets import raw milk from nearby states. At the same time, the Charleston, West Virginia and Pittsburgh, Pennsylvania markets draw substantial quantities of their milk supply from Ohio producers. These facts suggest that market interdependence transcends state boundary lines.

FIGURE 4

NUMBER OF FARMS REPORTING WHOLE MILK SOLD, BY COUNTIES, OHIO
1949 AND 1959

FIGURES IN EACH COUNTY
Top 1959
Bottom 1949

Source: CENSUS OF AGRICULTURE FOR OHIO, 1949 and 1959.

Table 9

Number of Farms Selling Whole Milk In Ohio
by Crop Reporting Districts, 1949
and 1959, and Percentage Change

Crop Reporting District	1949 Farm Numbers	1949 Per Cent Total	1959 Farm Numbers	1959 Per Cent Total	Percentage Decrease Farm Numbers
Northeast	11,425	13.5%	6,563	14.0%	42.6%
East Central	5,303	6.3	3,975	8.5	25.0
Southeast	7,782	9.2	5,081	10.8	34.7
North Central	8,954	10.6	4,894	10.4	45.4
Central	11,355	13.4	6,157	13.1	45.8
South Central	5,552	6.6	3,779	8.1	32.0
Northwest	14,477	17.1	5,989	12.8	68.7
West Central	13,259	15.7	7,229	15.4	45.5
Southwest	6,442	7.6	3,216	6.9	50.1
Total, Ohio	84,549	100.0%	46,883	100.0%	44.5%

Source: United States Census of Agriculture

Table 10

Number of Milk Producers in Fulton County, 1957 and 1962, and Projected to Equilibrium by Markov Process

	Grade A		Grade B			
Year	Number	Index 1962=100	Number	Index 1962=100	Total Number of Producers	Index 1962=100
1957	389	172%	238	227%	627	189%
1962	226	100	105	100	331	100
1967	215	95	87	83	302	91
1972	179	79	68	65	247	75
1977	158	70	63	60	221	67
1982	147	65	57	54	204	62
1987	141	62	54	51	195	60
1992	137	61	53	50	190	57
Final Equilibrium	132	58	53	50	185	56

Source: Krill, Melvin K., An Analysis of the Dynamics of the Milk Producing Industry and the Factors Influencing Milk Producers to Discontinue Dairying, Unpublished Master's Thesis, The Ohio State University, 1962.

Table 11

Average Number of Producers 1/ Marketing Milk at Fluid Milk Markets and at Manufacturing Milk Plants, Ohio, 1948 to 1962

Year	Fluid Markets		Manufacturing Mkts.	
	Number of Producers	Index (1948=100)	Number of Producers	Index (1948=100)
1948	31,000	100.0	52,000	100.0
1950	28,000	90.3	50,000	96.2
1952	27,500	88.7	45,000	86.5
1954	28,000	90.3	42,500	81.7
1956	26,000	83.9	40,000	76.9
1958	25,500	82.3	31,000	59.6
1960	23,000	74.2	25,500	49.0
1962	20,000	64.5	23,000	44.2

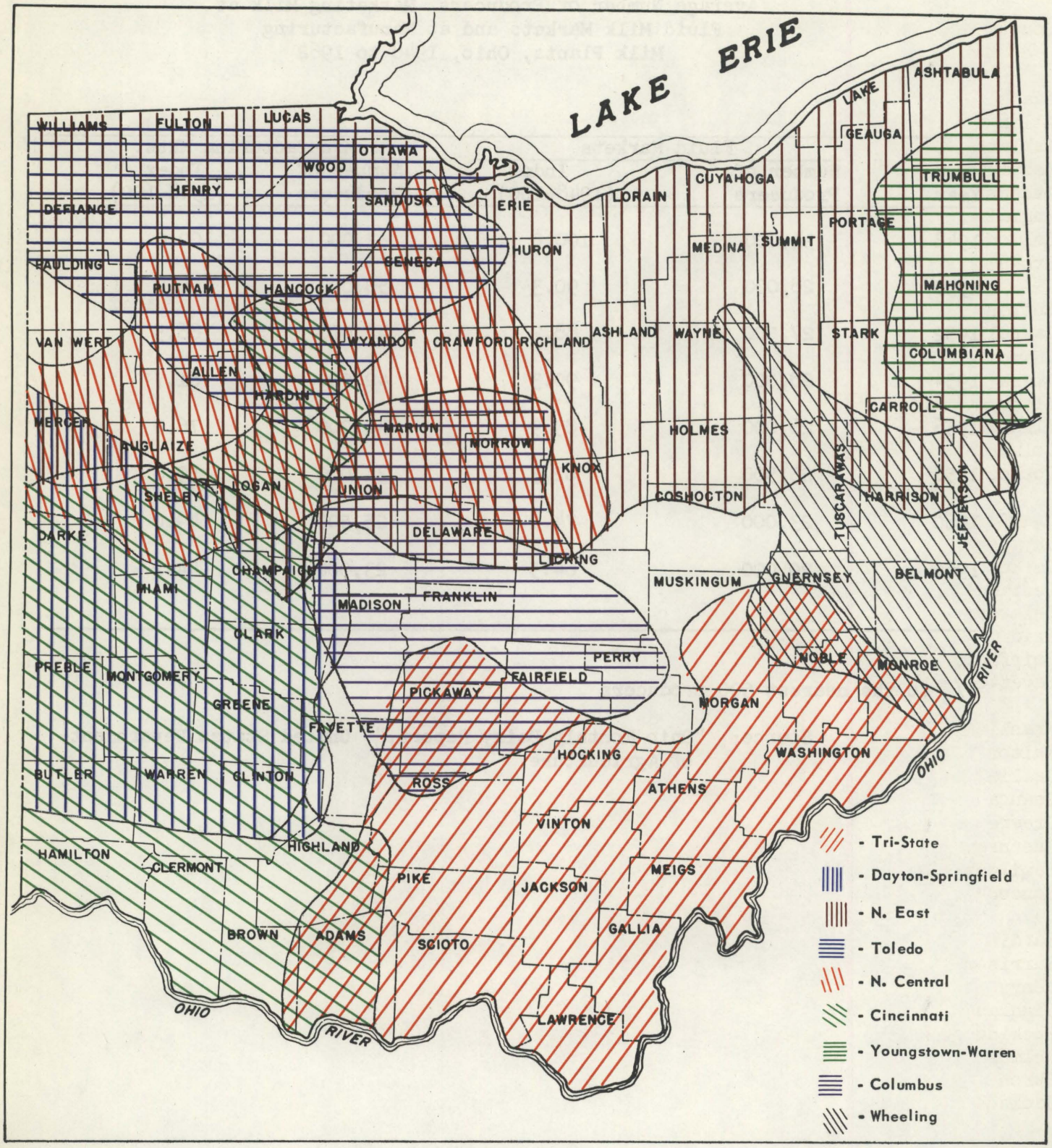
1/ to the nearest 500 producers

Source: "Ohio Monthly Dairy Report," United States Department of Agriculture.

FIGURE 5

PROCUREMENT AREAS OF THE FEDERAL MARKETING

ORDERS, DECEMBER 1962



Source: Managers of Dairy Cooperatives

Table 12
Number of Producers by Federal Order Market by
County of Origination--December 1962

County of Origin	Federal Order Markets									
	Cincinnati	Columbus	Dayton	N.C. Ohio	N.E. Ohio	Toledo	Tri-State	Wheeling	Youngstown	Total
Adams	74						64			138
Allen	7			98	19	6				130
Ashland				24	307					331
Ashtabula					288				92	380
Athens							119			119
Auglaize	15		125	132	8					280
Belmont								212		212
Brown	134						2			136
Butler	300		1							301
Carroll					87			28		115
Champaign	52	76	155		27					310
Clark	27	4	149							180
Clermont	124									124
Clinton	[illegible]		10							153
Columbiana					159			53	142	354
Coshocton					32					32
Crawford		4		36	98					138
Cuyahoga					9					9
Darke	66		164							230
Defiance				7	5	31				43
Delaware	1	194		4	35					234
Erie					27					27
Fairfield		168					24			192
Fayette	3	3	5				6			17
Franklin		126					15			141
Fulton						149				149
Gallia							57			57
Geauga					174				9	183
Greene	18		102							120
Guernsey							19	61		80
Hamilton	92									92
Hancock	16			79	27	6				128
Hardin	45	21		36	28	5				135
Harrison				20	16			114		130
Henry					5	56				81
Highland	128		3				7			138
Hocking							22			22
Holmes					384			1		385
Huron				5	235	1				241
Jackson							55			55

Table 12 con't.

County of Origin	Cincinnati	Columbus	Dayton	N.C. Ohio	N.E. Ohio	Toledo	Tri-State	Wheeling	Youngstown	Total
Jefferson					11			85		96
Knox		44		23	205					272
Lake					13					13
Lawrence							62			62
Licking		251		5	13					269
Logan	72	46	73	26	106					323
Lorain					340					340
Lucas						6				6
Madison	1	99	3				4			107
Mahoning					74				140	214
Marion	8	12		17	51					88
Medina					427			2		429
Meigs							48			48
Mercer	16		213	40	29					298
Miami	77		105							182
Monroe							30	58		88
Montgomery	29		119							148
Morgan							60			60
Morrow	1	39		13	56		1			110
Muskingum		15					17	21		53
Noble							13	4		17
Ottawa				3	13	44				60
Paulding					9	2				11
Perry		13					6			19
Pickaway		42					30			72
Pike	7						41			48
Portage					264				9	273
Preble	76		105							181
Putnam	3			70	49	63				185
Richland		8		56	111					175
Ross	5	1					27			33
Sandusky				21	79	66				166
Scioto							101			101
Seneca	4			47	160	48				259
Shelby	67		165	17						249
Stark					560			1	2	563
Summit					74					74
Trumbull					30				255	285
Tuscarawas					349			33		382
Union	14	153	3	3	62					235

Table 12 con't.

County of Origin	Cincinnati	Columbus	Dayton	N.C. Ohio	N.E. Ohio	Toledo	Tri-State	Wheeling	Youngstown	Total
Van Wert			3	33	24					60
Vinton							18			18
Warren	113		10							123
Washington							133			133
Wayne					998			13		1011
Williams					5	92				97
Wood					38	60				98
Wyandot	10	13		29	53					106
Total	1748	1332	1513	813	6173	667	981	686	649	14562

Source: Ohio Federal Milk Market Statistics.

Table 13

Number of Out of State Producers by Ohio Federal Order Markets by County of Origination December, 1962

State & Counties	Cincinnati	Columbus	Dayton	North Central	North East	Toledo	Tri-State	Wheeling	Youngstown	Total
Indiana										
Adams			1	44	103					148
Jay	1		23	9	47					80
Wells				18	75					94
Bartholomew	2									2
Dearborn	88									88
Decatur	24									24
Fayette	13		4							17
Franklin	76		1							77
Grant	1									1
Huntington	29				66					95
Jefferson	24									24
Kosciusko	1				69					70
Ohio	50									50
Randolph	10		37		49					96
Ripley	94									94
Rush	7									7
Scott	6									6
Switzerland	78									78
Union	31		13							44
Wabash	8				29					37
Wayne	25		37							62
Whitley	3				63					66
Delaware			4							4
Henry			1							1
Elkhart					240					240
Noble					139	1				140
LaGrange					108	8				116
Steuben					74	56				130
Dekalb					58	17				75
St. Joseph					39					39
Marshall					39					39
Allen					43	2				45
Fulton					34					34
Blackford					8					8
La Porte					11					11
Starke					8					8
Miami					5					5
Michigan										
Branch					73	28				101
Hillsdale					62	57				119
Jackson					7	7				14
Lenawee					18	207				225
Monroe						54				54
Washtenaw						20				20
St. Joseph					70					70
Cass					28					28
Calhoun					30					30
Berrien					10					10
Van Buren					7					7

Table 13 con't.

State & Counties	Cincinnati	Columbus	Dayton	North Central	North East Toledo	Tri-State	Wheeling	Youngstown	Total
Pennsylvania									
Crawford					33			50	83
Mercer					16			173	189
Greene							1		1
Washington							41		41
Erie								85	85
Lawrence								41	41
Butler								9	9
West Virginia									
Marshall							52		52
Brooke							16		16
Hancock							7		7
Ohio							88		88
Wetzel							1		1
Cabell						6			6
Mason						4			4
Wood						56			56
Pleasant						7			7
Ritchie						5			5
Wirt						8			8
Tyler						12			12
Wayne						4			4
Monroe						36			36
Jackson						1			1
Greenbrier						57			57
Pocahontas						5			5
Fayette						4			4
Summers						5			5
Raleigh						1			1
Kentucky									
Boone	171								171
Bourbon	1					5			6
Bracken	146								146
Campbell	110								110
Carroll	55								55
Fayette	1					5			6
Fleming	27					30			57
Franklin	1								1
Gallatin	56								56
Grant	114								114
Trimble	2								2
Harrison	47					5			52
Henry	50								50
Kenton	53								53
Lewis	1					111			112
Mason	34					31			65
Owen	52								52
Pendleton	234								234
Robertson	16					1			17
Scott	3					4			7
Shelby	19					1			19
Woodford						1			1
Boyd						41			41

Table 13 con't.

States & Counties	Cincinnati	Columbus	Dayton	North Central	North East	Toledo	Tri-State	Wheeling	Youngstown	Total
Carter							17			17
Greenup							11			11
Rowan							2			2
Lawrence							21			21
Nicholas							12			12
Bath							28			28
Morgan							2			2
Clark							5			5
Montgomery							7			7
Menifee							2			2
Floyd							7			7
Totals	1764	00	121	71	1661	457	569	206	358	5207

Source: Federal Milk Market Statistics

Production

Figures 6 and 7 and Table 14 show that milk production has increased 19.9% from 1949 to 1959. This increase, however, has not been constant across the state. For example, the Northwestern Crop Reporting District experienced a net decrease of 8.3% during this period. The South Central and East Central Districts experienced the greatest percentage increases. The North East, West Central and Central districts, in order, lead in total production in 1959, together producing 63.3% of milk produced and sold in Ohio.

Table 15 indicates that production per farm in Ohio has increased by 116% from 1949 to 1959. Increases ranged from 78% in the East Central Crop Reporting District, to 131% in the North Central District. This increase in per farm production has more than offset the decline in farm numbers, resulting in the 19.9% increase in total production noted above.

The greatest increase in production occurred on farms producing milk for fluid markets. These farms experienced an average increase of 221% from 1948 to 1962, while the increase on farms selling to manufacturing plants was 65%. This resulted in an average difference of 485 poinds of milk per day in 1962, as shown in Table 16.

Table 17 indicates the same general trend with respect to individual fluid markets. One should especially note the substantial differences in average size of producers among markets. For example, in 1962, the average producer in the Cincinnati market delivered 485 poinds of milk per day, compared to 880 pounds in the Toledo market.

Some of the variation in production per farm can be attributed to the adoption of the bulk tank. Table 18 indicates the variation among markets in the extent of adopting this technoligical advance. At present, four

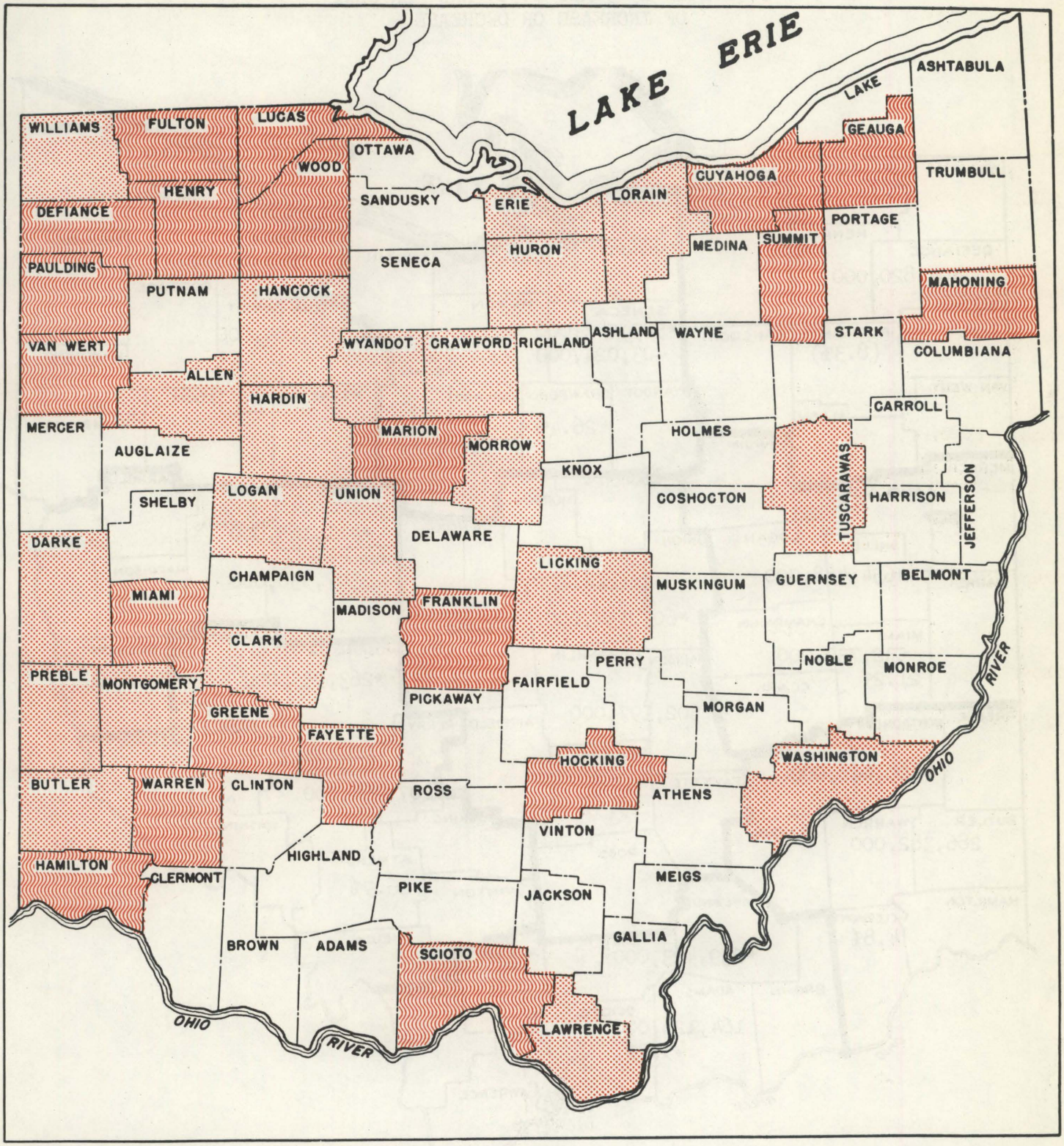
Ohio fluid markets buy wholly from bulk tank producers (Table 18). Production per producer in these markets is, on the average, considerably greater than in markets still buying from can operators. Furthermore, in markets having both bulk tanks and cans, production is greater with bulk tank operations. For example, in the Northeast Federal Order Market, 41% of all producers utilize bulk equipment, but produce 60% of the milk sold.

In addition to the conversion to bulk tanks, other capital improvements and expansion help explain the increase in production of milk per farm. Table 19 summarizes one study showing an increase of $40,000 in the average investment in Ohio dairy farms from 1951 to 1961. This is an increase of nearly 400% among producers participating in the farm record keeping program at The Ohio State University.

To some extent, Table 20 gives further evidence of the overlap in procurement areas among Ohio fluid milk markets. The relative importance of each market as an outlet for the individual counties is indicated here. Table 21 shows the importance of Ohio markets to producers in individual counties outside the state by indicating the pounds of milk participating in the various Ohio markets pools.

RELATIVE CHANGES IN MILK PRODUCTION IN OHIO COUNTIES FROM 1949 TO 1959 [a]

FIGURE 6



Increasing faster than state average

Increasing slower than state average

Decreasing

a/ Total production in Ohio increased by 19.9% from 1949 to 1959.

Source: United States Census of Agriculture

FIGURE 7

MILK PRODUCTION IN OHIO BY DISTRICTS: POUNDS IN 1949 AND 1959; AND PER CENT OF INCREASE OR DECREASE

State Total
3,605,886,000
*4,323,381,000
19.9% - State increase in production

*1959 Production
1949 Production
( ) - indicates decrease

Source: U.S. Census of Agriculture

Table 14

Milk Production in Ohio by Crop Reporting Districts, 1949 and 1959 and Percentage Change

Crop Reporting District	1949 Production (thousands lbs.)	1949 Per Cent of Total	1959 Production (thousands lbs.)	1959 Per Cent of Total	Percentage Change (1949 1959)
Northeastern	797,103.7	22.1%	973,518.9	22.5%	22.1%
East Central	307,530.0	8.5	411,165.4	9.5	33.7
Southeastern	207,964.3	5.8	263,954.9	6.1	26.9
North Central	403,023.6	11.2	509,542.0	11.8	26.4
Central	502,197.0	13.9	600,137.2	13.9	19.5
South Central	164,125.8	4.6	239,423.2	5.5	45.9
Northwestern	404,820.4	11.2	371,127.3	8.6	- 8.3
West Central	532,739.3	14.8	654,447.5	15.1	21.2
Southwestern	286,381.7	7.9	300,065.7	7.0	4.8
Total	3,605,885.8	100.0%	4,323,382.1	100.0%	19.9%

Source: U. S. Census of Agriculture

Table 15

Milk Production Per Farm In Ohio By Crop Reporting Districts, and Percentage Change, 1949 and 1959

Crop Reporting District	1949 Pounds Milk	1959 Pounds Milk	Percentage Increase
Northeast	69,768	148,334	113%
East Central	57,992	103,438	78
Southeast	26,724	51,949	94
North Central	45,010	104,116	131
Central	44,227	97,472	120
South Central	29,562	63,356	114
Northwest	27,963	61,968	122
West Central	40,175	90,531	125
Southwest	44,455	93,304	110
Average, Ohio	42,649	92,216	116%

Source: U. S. Census of Agriculture

1/ Table 16
Average Daily Volume of Milk Marketed Per Producer
at Ohio Fluid Milk Markets and at Ohio
Manufacturing Milk Plants, 1948-1962

Year	Fluid Markets (Pounds)	Index 1948=100	Manufacturing Plants (Pounds)	Index 1948=100
1948	195	100	85	100
1950	225	115	90	106
1952	250	128	95	112
1954	300	154	100	118
1956	365	187	120	141
1958	455	233	115	135
1960	495	254	110	129
1962	625	321	140	165

1/ To the nearest five pounds

Source: "Ohio Monthly Dairy Report," United States
Department of Agriculture

Table 17
Average Daily Delivery of Milk Per Producer
to Handlers Regulated Under Selected
Federal Milk Orders
1953 - 1962

(Pounds)

Market	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
Cincinnati	219	234	255	286	312	324	347	385	438	485
Columbus	324	352	378	405	432	453	501	565	743	835
Dayton-Springfield	310	331	369	406	449	464	515	597	682	739
North Central Ohio	280	301	344	369	400	440	490	539	618	676
Northeastern Ohio	297	312	342	366	387	415	452	489	543	600
Toledo	290	314	347	388	436	504	604	715	816	880
Tri-State	232	243	259	288	300	322	357	411	467	489
Wheeling	---	---	251	297	301	320	352	369	434	488
Youngstown-Warren	---	---	---	---	---	---	---	---	555	626
Detroit	340	343	365	388	415	459	509	585	633	691
Chicago	501	529	547	597	658	702	736	770	820	890

Source: Federal Milk Market Statistics

Table 18

Per Cent of Producers Utilizing Bulk Equipment and
Per Cent of Milk Receipts From Bulk Producers
By Market, March 1963

Market	Producers (Per Cent)	Production (Per Cent)
Columbus	100	100
Tri-State	100	100
Dayton-Springfield	100	100
Toledo	100	100
Wheeling	84	90
North Central	72	83
Cincinnati	66	78
Youngstown	55	69
Northeast	41	60

Source: Federal Milk Market Statistics

Table 19

Average Investment Per Dairy Farm in Ohio
Among Producers Participating in The
Ohio State University Record Keeping
Program

1951, 1956, 1961

Year	Average Investment
1951	$10,955
1956	32,702
1961	51,537

Source: Farm Business Analysis Report 1951, 1956, 1961

Table 20

Percentage of Receipts by Selected Markets by County of Origin

December, 1962

County	Wheeling	Cincinnati	Tri-State	N.E. Ohio	Columbus	Dayton	N.Central	Toledo	Youngstown	Production (thousands of lbs)
Adams		50.7	49.3							1989
Allen		3.3		14.5			75.7	6.5		2707
Ashland				91.5			8.5			7513
Ashtabula				71.5					28.5	8001
Athens			100.0							1840
Auglaize		4.0		3.0		41.6	51.4			6045
Belmont	100.0									3500
Brown		98.5	1.5							1755
Butler		98.7				1.3				5572
Carroll	24.3			75.7						1885
Champaign		11.6		5.5	30.1	52.8				7617
Clark		6.3			2.7	91.0				4364
Clermont		100.0								1455
Clinton		92.0				8.0				2641
Columbiana	14.5			37.1					48.4	5974
Coshocton				100.0						463
Crawford				61.4	6.8		31.8			2915
Cuyahoga				100.0						129
Darke		19.7				80.3				5282
Defiance				10.1			8.8	81.1		991
Delaware		0.1		8.8	89.7		1.4			4946
Erie				100.0						744
Fairfield			5.2		94.8					4592
Fayette		24.2	11.6		35.0	29.2				308
Franklin			3.7		96.3					3431
Fulton								100.0		3434
Gallia			100.0							857
Geauga				93.9					6.1	3334
Greene		11.9				88.1				2518
Guernsey	76.7		23.3							1305
Hamilton		100.0								1465
Hancock		8.4		29.1			57.3	5.2		2513
Hardin		24.1		15.4	24.3		32.2	4.0		2416
Harrison	84.3			15.7						2214
Henry				4.6			16.8	78.6		1548
Highland		94.3	4.6		1.1					2562

Table 20 con't.

County	Wheeling	Cincinnati	Tri-State	N.E. Ohio	Columbus	Dayton	N. Central	Toledo	Youngstown	Production (thousands of lbs)
Hocking			100.0							295
Holmes	0.4			99.6						5562
Huron				97.6			2.0	.4		4784
Jackson			100.0							787
Jefferson	92.6			7.4						1510
Knox				68.4	22.5		9.1			5484
Lake				100.0						191
Lawrence			100.0							753
Licking				3.2	95.3		1.5			5983
Logan		16.6		23.3	20.8	28.7	10.6			7323
Lorain				100.0						7324
Lucas								100.0		151
Madison		.4	1.6		93.2	4.8				3115
Mahoning				27.8					72.2	4016
Marion		3.9		55.8	15.6		24.7			2220
Medina	0.3			99.7						10,067
Meigs			100.0							649
Mercer		6.0		5.8		74.7	13.5			6576
Miami		34.8				65.2				3210
Monroe	72.7		27.3							1304
Montgomery		17.3				82.7				3238
Morgan			100.0							1119
Morrow		0.7	0.2	36.5	51.9		10.7			2332
Muskingum	31.4		29.0		39.6					1090
Noble	26.7		73.3							272
Ottawa				16.4			8.8	74.8		1052
Paulding				61.3				38.7		181
Perry			21.7		78.3					417
Pickaway			21.7		78.3					1498
Pike		13.5	86.5							727
Portage				96.4					3.6	5187
Preble		39.9				60.1				3823
Putnam		.6		28.4			31.7	39.3		3631
Richland				59.2	7.0		33.8			3757
Ross		24.5	68.9		6.6					607
Sandusky				38.3			13.3	48.4		3155
Scioto			100.0							1709
Seneca		.7		54.6			22.6	22.1		5177
Shelby		21.5				69.6	8.8			4936

Table 20 con't.

County	Wheeling	Cincinnati	Tri-State	N.E. Ohio	Columbus	Dayton	N.Central	Toledo	Youngstown	Production (thousands of lbs)
Stark	0.1			98.9					1.0	10,094
Summit				100.0						1,235
Trumbull				11.9					88.1	6,313
Tuscarawas	8.7			91.3						6,225
Union		2.7		14.5	78.6	1.9	2.3			5,683
Van Wert				30.7		5.1	64.2			967
Vinton			100.0							270
Warren		90.8				9.2				2,098
Washington			100.0							2,468
Wayne	1.0			99.0						21,174
Williams				2.2				97.8		2,726
Wood				35.3				64.7		1,887
Wyandot		7.5		47.5	19.4		24.8	0.8		2,353
Total (000)	11,262	28,240	14,968	116,823	35,463	35,389	18,375	14,889	14,122	

Source: Federal Milk Market Statistics

Table 21

Out of State Receipts by Selected Markets
by County of Origin
December, 1962

(Thousands of Pounds)

State & Counties	Cincinnati	Columbus	Dayton	North Central	North East	Toledo	Tri-State	Wheeling	Youngstown
Indiana									
Adams			22	1196	1381				
Allen					406	57			
Bartholomew	142								
Blackford					198				
Dearborn	1046								
Decatur	479								
Dekalb					838	639			
Delaware			135						
Elkhart					3788				
Fayette	175		47						
Franklin	1198		34						
Fulton					339				
Grant	43								
Henry			30						
Huntington	832				976				
Jay	10		135	156	479				
Jefferson	358								
Kosciwko	40				955				
LaGrange					1601	311			
La Porte					145				
Marshall					463				
Miami					47				
Noble					2518	27			
Ohio	614								
Randolph	240		765		532				
Ripley	1376								
Rush	251								
Scott	194								
Starke					124				
Steuben					912	1785			
St. Joseph					563				
Switzerland	842								
Union	513		273						
Wabash	283				429				
Wayne	673		852						
Wells				316	1027				
Whitley	70				755				
Michigan									
Berrien					137				
Branch					859	1183			
Calhoun					411				
Cass					582				
Hillsdale					726	2154			
Jackson					75	393			
Lenawee					154	6957			
Monroe						1269			
St. Joseph					1232				
Van Buren					114				
Washtenaw						868			

Table 21 con't.

State & Counties	Cincinnati	Columbus	Dayton	North Central	North East	Toledo	Tri-State	Wheeling	Youngstown
Pennsylvania									
Butler									92
Crawford					772				1517
Erie									2428
Greene								24	
Lawrence								548	
Mercer					356				2437
Washington								675	
West Virginia									
Brooke								263	
Cabell							100		
Fayette							16		
Greenbrier							1001		
Hancock								126	
Jackson							5		
Marshall								842	
Mason							985		
Monroe							534		
Ohio								1438	
Pleasant							53		
Pocahontas							59		
Raleigh							5		
Ritchie							101		
Summers							49		
Tyler							156		
Wayne							82		
Wetzel								9	
Wirt							101		
Wood							985		
Kentucky									
Bath							28		
Boone	2013								
Boyd							590		
Bourbon	23						528		
Bracken	1206								
Campbell	1143								
Carroll	526								
Carter							17		
Clark							5		
Fayette	5						220		
Fleming	272						287		
Floyd							7		
Franklin	9								
Gallatin	475								
Grant	1066								
Greenup							11		
Harrison	407						110		
Henry	634								
Kenton	792								
Lawrence							21		
Lewis	4						1209		
Mason	331						250		

Table 21 con't.

State & Counties	Cincinnati	Columbus	Dayton	North Central	North East	Toledo	Tri-State	Wheeling	Youngstown
Menifee							2		
Montgomery							7		
Morgan							2		
Nicholas							12		
Owen	574								
Pendleton	2041								
Robertson	86						18		
Rowan							2		
Scott	68								
Shelby	201								
Trimble	26								
Woodford							20		
Totals	21,230	00	2609	1667	23,894	15,644	6725	3370	7022

Source: Federal Milk Market Statistics

III

Producer Cooperatives

The number of dairy marketing cooperatives in this state has decreased materially since 1950. Although no specific data were developed on cooperative memberships, it is likely that a higher percentage of the total market supplies was produced by members of these cooperatives in 1962, than was the case in 1950.

The decrease in the number of cooperatives can be traced to several major causes. The most significant cause in recent years has been the consolidation of processing facilities in the larger cities. As a result, plants in many secondary markets were closed and cooperatives representing these producers were no longer needed. There have also been several cooperative consolidations in this state since 1950. In addition, the rising costs of providing the necessary services to members became prohibitive for certain smaller organizations.

Table 22

Ohio Milk Producer Federation Membership
January 1, 1950, 1956, 1963

Cooperative	1950	1956	1963
Milk Producers Federation of Cleveland	2,946	2,885	2,900
Lorain County Sales	230	---	---
Stark County Milk Producers	1,100	1,000	742
Central Ohio Coop	2,000	1,500	1,137
North Central Coop	170	315	---
Northwestern Coop	2,353	2,400	2,000
Scioto County Coop	252	269	---
Akron Milk Producers	1,510	1,450	877
KIO Milk Producers	2,127	---	---
Miami Valley Coop	1,620	2,000	1,650
Dairymen's Coop	3,269	---	1,300
Cooperative Pure Milk Assn.	2,000	2,000	850
Marion Milk Producers	100	100	---
Athens Milk Sales	232	---	---
Dorset Coop Milk	158	---	---
Huntington Interstate	600	---	---
Coshocton Dairy Coop	185	---	---
Ross County Milk Producers	100	76	---
Cincinnati Milk Sales	---	---	2,000
Marietta Milk Producers	---	335	---
Tuscarawas Coop Sales	160	150	---
Southeastern Ohio	---	---	620
Total Membership	21,112	14,480	14,076
Total Member Coops	19	13	10

Source: Ohio Milk Producers Federation

Table 23
Ohio Milk Marketing Cooperatives in Existence
on January 1, 1950, 1956, and 1963

Cooperative	1950	1956	1963
Milk Producers Federation of Cleveland	x	x	x
Stark County Milk Producers	x	x	x
Central Ohio Cooperative Milk Producers	x	x	x
Northwestern Cooperative Sales Assn.	x	x	x
Akron Milk Producers	x	x	x
Miami Valley Milk Producers Assn.	x	x	x
Cooperative Pure Milk Assn.	x	x	x
Cincinnati Milk Sales Assn.	x	x	x
Southeastern Ohio Cooperative Milk Prod.			x
Dairymen's Cooperative Sales Assn.	x	x	x
KIO Milk Producers Assn.	x	x	
Milk Producers Union	x	x	
Scioto County Cooperative Milk Prod. Assn.	x	x	x
Marietta-Athens Milk Producers Assn.			x
Marietta Cooperative Milk Producers	x	x	
Athens Milk Sales Assn.	x	x	
Hocking Valley Dairymen's Coop.	x	x	
Equity Dairies, Inc.	x	x	x
Great Lakes Milk Marketing Federation			x
Pickaway Dairy Cooperative Assn.	x	x	x
Huntington Interstate Milk Prod. Assn.	x	x	x
Sandusky Cooperative Milk Prod. Assn.	x	x	x
Tuscarawas Valley Coop. Dairy Sales Assn.	x	x	x
Tri-County Prod. Coop.		x	x
Muskingum Valley Coop. Dairy Sales Assn.	x	x	x
Barnesville Dairymen's Coop. Assn.	x	x	
Broad Run Dairy Farmers Coop. Assn.	x	x	x
Coshocton Dairy Coop. Co.	x	x	x
Mad River Milk Producers, Inc.	x	x	x
Lancaster Milk Prod. Assn.	x	x	
North Central Ohio Dairy Sales Assn.	x	x	
Ross Co. Milk Prod. Assn.	x	x	
Gallia Co. Cooperative Dariy Sales	x	x	
Guernsey Co. Milk Prod., Inc.	x	x	
Miami Co. Cooperative Milk Prod. Assn.	x		
Dorset Coop. Milk Co.	x	x	x
Marion Milk Prod.	x	x	
Lorain Co. Cooperative Sales Assn.	x		
Total Number	34	33	24

Source: Files, Department of Agricultural Economics, The Ohio State University

Table 24
Percentage of Member and Nonmember Milk In Federal Order Markets Reported by Cooperative and Proprietary Order Handlers, by Region and by Market, Average of Four Selected Months, 1960

Region and Market	Total Milk in pool	Per Cent of Total Milk Reported By						
		Cooperative order handlers			Proprietary order handlers			
		Member:	Nonmember:	Total	Member:	Nonmember:	Total:	Total
	Mil. lbs.	Per Cent			Per Cent			
Wheeling	14	8	0	8	60	32	92	100
Tri-State	21	8	0	8	77	15	92	100
So. Mich.	254	54	0	54	35	11	46	100
Toledo	26	0	0	0	94	6	100	100
N.E. Ohio	133	20	0	20	47	33	80	100
N. Central Ohio	20	0	0	0	81	19	100	100
Columbus	28	0	0	0	81	19	100	100
Dayton-Springfield	36	39	7	46	38	16	54	100
Cincinnati	47	19	0	19	71	10	81	100
Fort Wayne	9	63	0	63	36	1	37	100
Chicago	438	38	1	39	45	16	61	100

Source: "Impact of Dairy Cooperatives on Federal Order Markets", August, 1963, Farmer Cooperative Service, USDA

Table 25
Cooperatives Classified by Number Performing Functions as Handlers Under Federal Orders, Those Not Performing Such Functions, and Total by Regions and Markets, Average of 4 Selected Months, 1960

Region and Market	Number of cooperatives with functions performed as handlers					Number of cooperatives not handlers for milk 3	Total Number of Cooperatives 3
	Receiving milk directly from producers at regulated--			Diverting milk 1	Receiving and delivering bulk tank milk 2		
	Supply Plants	Distributing Plants	Supply Equalization Plants				
Wheeling	0	2	0	0	0	1	3
Tri-State	1	1	0	1	0	6	8
So. Mich.	6	5	9	0	2	2	10
Toledo	0	0	0	0	0	1	1
N.E. Ohio	2	1	1	2	0	4	8
No. Central Ohio	0	0	0	0	0	2	2
Columbus	0	0	0	0	0	1	1
Dayton-Springfield	0	0	1	1	0	0	1
Cincinnati	0	1	0	0	0	1	2
Fort Wayne	0	2	0	2	0	0	2
Chicago	18	1	0	0	0	6	23

1/ Diverting milk directly from producers to nonregulated plant(s) or to regulated plant(s).
2/ Receiving bulk milk directly from producers in tank trucks and delivering it to regulated plant(s).
3/ Number of cooperatives for a region is less than total member operating in all Federal order markets within a region (with exception of Pacific area) due to multi-market operations of many associations.

Source: "Impact of Dairy Cooperatives on Federal Order Milk Markets", August, 1963. Farmer Cooperative Service, U.S.D.A.

IV

Federal Order Statistics

Table 26 shows that there are some significant differences in the provisions of the various federal orders in Ohio. Despite these differences in order provisions, the resulting blend prices to producers on an annual basis are not far different. The widest variation in the blend price paid to producers in 1962, in the first six markets listed, is 25 cents per cwt.

The widest variation in Class I prices was 55 cents per cwt. During 1962, the Class I utilization ranged from 60% to 78%. It should be recognized, however, that there are different classification systems in use in the various markets. If these differences were eliminated the range of utilization percentages would probably change.

Care and understanding is necessary if an accurate comparison is to be made of class prices, utilization, and blend prices among the markets included in this study. It is necessary to evaluate all provisions of the various orders to determine the net effect on producers and/or processors.

Table 26

Provisions of Selected Federal Milk Market Orders
1962

	Type of Pool	Basic Formula	Fluid Differential 1/	Seasonal Incentive Plan	No. of Classes
Cincinnati	Market Wide	3.13	1.33	Take-off pay back	I II III III Jan-Feb-Butter III Sept-Dec. "
Columbus	Market Wide	3.13	1.11	Take-off pay back	I II III IV
Dayton-S.	Market Wide	3.13	1.23	Take-off pay back	I II II Butter
N. East	Market Wide	3.11	1.65	Varying Class I Diff.	I II III
N. Central	Individual Handler	3.11	1.36	Varying Class I Diff.	I II
Tri-State	Individual Handler	3.07	1.59	Varying Class I Diff.	I II III
Toledo	Individual Handler	3.09	1.45	Varying Class I Diff.	I II
Wheeling	Market Wide	3.11	1.73	Varying Class I Diff.	I II
Youngstown-W.	Market Wide	3.11	1.75	Varying Class I Diff.	I II

1/ Annual average of differentials specified in order to be added to the manufacturing milk price.

Source: Federal Milk Order Market Statistics, Statistical Bulletin No. 335, USDA

Table 27
Average Federal Order Class I and Blend Milk Prices for 3.5% Milk
For Selected Markets
1953-1962

	Yearly Average									
	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
CINCINNATI										
Class 1	4.90	4.56	4.56	4.81	4.63	4.58	4.72	4.72	4.85	4.77
Blend	4.50	4.05	4.06	4.25	4.14	4.10	4.21	4.16	4.27	4.24
COLUMBUS										
Class 1	4.63	4.27	4.29	4.45	4.52	4.36	4.47	4.43	4.52	4.30
Blend	4.45	4.04	4.09	4.21	4.35	4.21	4.34	4.23	4.30	4.09
DAYTON-SPRINGFIELD										
Class 1	4.58	4.36	4.31	4.49	4.42	4.28	4.54	4.48	4.58	4.48
Blend	4.31	4.06	4.00	4.14	4.11	3.99	4.25	4.10	4.17	4.10
NORTH-CENTRAL										
Class 1	4.60	4.33	4.16	4.53	4.43	4.18	4.16	4.24	4.29	4.22
Blend	4.14	3.82	3.90	4.20	4.25	4.07	4.07	4.12	4.10	3.99
NORTHEAST OHIO										
Class 1	4.87	4.46	4.48	4.86	4.77	4.52	4.50	4.58	4.63	4.51
Blend	4.41	4.05	4.11	4.45	4.41	4.15	4.15	4.20	4.15	4.00
TOLEDO										
Class 1	4.61	4.32	4.31	4.71	4.56	4.46	4.48	4.60	4.54	4.38
Blend	4.41	4.14	4.14	4.55	4.43	4.32	4.29	4.37	4.26	4.08
TRI-STATE										
Class 1	4.72	4.56	4.63	4.86	4.95	4.76	4.82	4.86	4.86	4.70
Blend	4.40	4.10	4.27	4.50	4.64	4.46	4.55	4.55	4.50	4.63
WHEELING										
Class 1			5.14	4.92	4.91	4.66	4.63	4.73	4.88	4.71
Blend			4.96	4.58	4.64	4.34	4.30	4.41	4.56	4.38
YOUNGSTOWN										
Class 1									4.85	4.61
Blend									4.58*	4.29
DETROIT										
Class 1	4.67	4.29	4.40	4.65	4.38	4.09	4.03	4.50	4.26	4.07
Blend	4.26	3.91	4.05	4.26	4.05	3.76	3.72	4.08	3.88	3.64
CHICAGO										
Class 1	4.16	3.73	3.80	4.06	3.86	3.72	3.68	3.82	3.92	3.78
Blend	3.87	3.47	3.54	3.69	3.56	3.40	3.38	3.46	3.59	3.50

*Data based on part of year
Source: Federal Milk Market Statistics

Table 28
Per Cent Class I Milk Utilization in Selected Federal Order Markets
1953 - 1962

	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962
Cincinnati	60	59	62	65	64	67	69	66	64	67
Columbus	72	71	73	74	79	80	83	79	77	76
Dayton-Springfield	72	73	73	74	75	77	81	74	71	73
North Central Ohio	70	69	77	77	85	86	87	83	77	77
Northeastern Ohio	66	65	69	72	73	71	71	69	61	60
Toledo	82	84	86	89	89	89	86	83	77	78
Tri-State	75	76	78	83	85	87	80	86	83	86
Wheeling	--	--	93	82	84	81	79	78	79	80
Youngstown	--	--	--	--	--	--	--	--	84	79
Detroit	71	70	73	72	69	66	64	68	63	58
Chicago	47	48	52	49	47	45	46	45	42	40

Source: Federal Milk Market Statistics

Table 29
Supply-Demand Adjustment in Various Federal Order Markets
1955 - 1962

	Cincinnati	Columbus	Dayton	N.C.	N.E.	Toledo	Tri-State	Wheeling	Youngstown	Chicago	Detroit
1955	+.10	+.05	-.05	-.18	-.18	+.11	+.09	.00	----	-.14	-.09
1956	+.19	+.06	-.02	-.04	-.04	+.21	+.16	-.06	----	-.07	-.10
1957	+.10	+.21	-.01	.00	.00	+.33	+.27	-.01	----	-.18	-.23
1958	+.19	+.19	-.03	-.12	-.12	+.34	+.13	-.10	----	-.20	-.42
1959	+.33	+.30	+.23	-.14	-.14	+.19	+.23	-.11	----	-.23	-.44
1960	+.28	+.20	+.14	-.22	-.22	.00	+.13	-.13	----	-.21	-.08
1961	+.23	+.12	+.06	-.25	-.25	-.13	+.05	-.09	-.10	-.24	-.38
1962	+.31	+.06	+.12	-.19	-.25	-.16	-.10	-.12	-.25	-.24	-.45

Source: Federal Milk Market Statistics

Table 30 1/
Negotiated Producer Premiums
Selected Milk Markets 2/
1956-62

5/

	Cincinnati		Columbus		Dayton-Spring.		N. Central		N. E. Ohio	
	Cl. I	Blend	Cl. I	Blend	Cl. I	Blend	Cl. I	Blend	Cl. I	Blend
1956:										
No. Prem. Mo. 3/	5	5	1	1	----	----	----	----	3	3
Av. Prem. 4/	$.1083	$.0754	$.02	$.0167	----	----	----	----	$.075	$.0617
1957:										
No. Prem. Mo.	3	3	----	----	3	3	----	----	7	7
Av. Prem.	.0706	.0529	----	----	$.0949	$.0746	----	----	.285	.1967
1958:										
No. Prem. Mo.	----	----	----	----	6	6	----	----	6	6
Av. Prem.	----	----	----	----	.1083	.085	----	----	.1443	.1088
1959:										
No. Prem. Mo.	----	----	----	----	----	----	2	2	4	4
Av. Prem.	----	----	----	----	----	----	$.075	.0558	.1305	.0958
1960:										
No. Prem. Mo.	----	----	2	2	----	----	4	4	4	4
Av. Prem.	----	----	.0333	.0267	----	----	.1125	.0823	.1167	.0767
1961:										
No. Prem. Mo.	----	----	2	2	----	----	10	10	10	10
Av. Prem.	----	----	.0208	.015	----	----	.2883	.2177	.3138	.1725
1962:										
No. Prem. Mo.	----	----	8	8	2	2	11	11	12	12
Av. Prem.	----	----	.116	.086	.009	.0058	.347	.2576	.375	.175

Table 30 con't.

	Toledo		Tri-State		Wheeling		Detroit		Chicago 5/	
	Cl. I	Blend	Cl. I	Blend	Cl. I	Blend	Cl. I	Blend	Cl. I	Blend
1956: 3/										
No. Prem. Mo.	----	----	----	----	----	----	9	9	----	----
Av. Prem. 4/	----	----	----	----	----	----	$.3319	$.2367	----	----
1957:										
No. Prem. Mo.	----	----	1	1	2	2	12	12	6	6
Av. Prem.	----	----	$.0167	$.015	$.0483	.0371	.5808	.4008	$.0925	n.a.
1958:										
No. Prem. Mo.	3	3	3	3	----	----	12	12	12	12
Av. Prem.	$.0625	$.0515	.0625	.0567	----	----	.6051	.3858	.2183	$.1099
1959:										
No. Prem. Mo.	----	----	----	----	----	----	12	12	12	12
Av. Prem.	----	----	----	----	----	----	.635	.395	.2017	.0827
1960:										
No. Prem. Mo.	6	6	----	----	----	----	12	12	12	12
Av. Prem.	.1388	.1103	----	----	----	----	.4467	.2767	.4725	.2358
1961:										
No. Prem. Mo.	11	11	----	----	----	----	12	12	12	12
Av. Prem.	.2667	.2047	----	----	----	----	.7803	.4367	.4292	.15
1962:										
No. Prem. Mo.	11	11	----	----	----	----	12	12	12	12
Av. Prem.	.292	.2285	----	----	----	----	.947	.5058	.56	.18

1/ Does not include premiums for quality, bulk delivery or handling charges for services performed.
2/ Markets selected are those for which price data is regularly reported with the exception of the Youngstown market which was not regulated by a Federal order prior to 1961.
3/ The number of months during the year that the market had a premium.
4/ The average premium was derived by dividing the total yearly premiums by twelve.
5/ During some years the Columbus and Chicage markets had premiums applicable to milk utilized in classifications other than Class I.

Source: Fluid Milk and Cream Report (U.S.D.A.), Federal Milk Market Statistics and Cooperative Milk Marketing Organizations

Table 31
Reserve and Excess Milk in Selected Federal Order Market Areas, by Month, 1962 1/
(nearest thousand pounds)

Month	Market				
	Columbus	Cincinnati	Dayton-Springfield	North-Central	Northeastern Ohio
January	4165	6340	7755	4768	45,694
February	4152	6786	8254	4342	43,445
March	3759	6224	7033	4115	43,819
April	4283	7920	8304	4878	49,000
May	7694	14,486	11,731	6278	61,110
June	7945	12,879	9656	5351	52,061
July	4426	8182	5699	5036	42,401
August	2286	8093	5409	4176	33,413
September	1865	6554	4969	3408	29,460
October	3627	6482	7170	3982	31,636
November	4336	5137	6210	4052	33,580
December	5060	7327	7773	5416	40,318

Month	Market				
	Toledo	Tri-State	Wheeling	Youngstown	Total
January	6014	566	1004	1380	77,686
February	6020	1053	873	1725	76,650
March	6049	923	1057	1410	74,389
April	7342	950	742	2810	86,211
May	8075	2254	2434	4830	188,892
June	7289	1733	1493	3270	101,677
July	4698	380	285	640	72,747
August	4619	293	195	270	58,754
September	3666	360	945	270	51,497
October	4518	220	1852	1205	60,692
November	4564	136	1748	1495	61,258
December	6571	818	1729	2015	77,090

1/ All milk not utilized in fluid form (Class I), cottage cheese, or ice cream less one per cent of producer receipts.
Source: Federal Milk Market Statistics.

V

Transportation Model*

Previous data indicates that milksheds in Ohio are considerably overlapped. This cross-shipment of milk between producers and processing plants has probably resulted for the most part, from the greater transportation flexibility inherent in the conversion to bulk tank operations. While this greater flexibility may be advantageous to the producer in terms of market selection, the tremendous overlap of shipments noted in Figure 5 above suggests that the total transportation cost might be substantially reduced if farmers shipped their milk to the nearest market. In order to realize this saving, substantial reorganization of the industry would be necessary. Before such reorganization might be considered feasible, it is important to know the magnitude of possible savings from this reorganization.

The task involved in answering this question is essentially to obtain the pattern of shipments from producer to processing plant which would minimize transportation costs. Once this pattern of shipments is found, transportation costs can be computed and compared with present transportation costs. This analysis can be conducted on an electronic computer using the transportation model [4/], a particular form of linear programming. The necessary information to obtain this answer is the cost of shipping from each supply point (county) to each demand point (market), the quantity of milk produced at each supply point, and the quantity demanded at each market. The solution obtained was relevant to and based upon the production and consumption data for December 1962. Transportation rates were obtained from all markets. Some

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* Dr. Francis E. Walker, Department of Agricultural Economics, The Ohio State University, assisted in this section.

4/ A clear understanding of the transportation method can be obtained from F.E. Walker and T.T. Stout, Transportation and Spatial Equilibrium Models, A.E. 350 (Columbus, Ohio, Department of Agricultural Economics and Rural Sociology, The Ohio State University, 1963)

information was available for local shipments, while other rates were available for long distance shipments (to 250 miles). While these transportation rates varied considerably from one market to another, it was possible to establish what may be considered a "typical" transportation cost function. Some actual costs were slightly higher than this typical function while others were slightly lower. Comparisons of the present overlapping shipments and the optimal pattern of shipments, however, were both based upon this typical function. Therefore the comparison should be valid even though the typical function might be slightly higher or lower than the average transportation rates. The transportation cost function estimated on the basis of observed rates was 20 cents per hundredweight plus two tenths of a cent per mile from 0 to 100 miles between producer and market. Over a hundred miles it was increased by .12 cents per mile.

Out of state sources of supply were not entered into the calculations of the model. They were taken out by subtracting producer receipts from outside the state from total receipts, leaving only that milk produced in Ohio to be allocated. Similarly, milk produced in Ohio but shipped outside Ohio was subtracted from the quantity produced at the various supply points. The model, then, should give the optimal allocation of milk which is produced in Ohio and moves to Ohio markets. The results of this system indicate milksheds for each market as shown in Figure 8. There is no overlap in this optimal pattern of shipments and typically all milk from a county is moved to the same market. The difference in transportation costs obtained or obtainable in the shift from the current milkshed pattern (Figure 5) to the optimal shipment pattern (Figure 8) was observed to be slightly over $800,000 annually. It might be noted, however, that collection route density might substantially be increased if such a shipment pattern was affected. For this reason,

transportation savings might exceed this amount due to more efficient collection. The possible savings, as computed, are approximately 2 1/2 cents per hundredweight.

Table 32

Farm to Plant Milk Hauling Rates
Selected Ohio Markets, June, 1963

Market	Farm to Plant Hauling Rate
Cincinnati	$0.35 per cwt. average
Columbus	$0.25 per cwt. within 50 miles 0.30 per cwt. over 50 miles
Dayton-Springfield	$0.26 per cwt. average
North-Central Ohio	$0.25 - 0.30 per cwt.
Northeastern Ohio:	
Akron	$0.22 per cwt. (bulk) 0.33 per cwt. (can)
Canton	$0.16 - 0.30 per cwt. with a $0.22 per cwt. average
Cleveland	$0.25 - 0.35 per cwt. within 40 miles 0.35 - 0.50 per cwt. for 40-100 miles 0.55 - 0.60 per cwt. over 100 miles
Toledo	$0.30 - 0.35 per cwt.
Tri-State:	
Athens	$0.30 per cwt.
Huntington	$0.40 per cwt.
Scioto	$0.27 per cwt.
Wheeling	$0.10 - 0.42 per cwt. 0.285 per cwt. average
Youngstown - Warren	$0.22 - 0.30 per cwt. 0.30 per cwt. over 50 miles

Source: Managers of Ohio Dairy Cooperatives.

Table 33

Savings Possible With Adoption of a Minimum Cost Model

	Month	Year
Present Cost	$838,683.73	$10,064,204.76
Proposed Cost	768,285.20	9,219,422.24
Savings	70,398.53	844,782.36
Savings as a Per Cent of Present Cost	8.41%	8.41%
Saving/100 lbs.	2.5¢	2.5¢
Savings per producer	$ 5.79	$ 69.48

Source: Computed

OPTIMUM ALLOCATION OF COUNTY PRODUCTION BY MARKET

December, 1962

FIGURE 8

VI

Handlers

The milk processing segment of the dairy industry has utilized many technological developments in recent years as the basis for many changes. Projection indicates that many of these changes are likely to continue. These technological developments have made it economically feasible for large multi-plant firms to consolidate processing operations at strategically centralized locations. Firm consolidation is one explanation of the substantial decrease in milk plant numbers noted in the first two tables of this section. Other factors include the premium placed on efficiency by Federal Milk Marketing Orders through the audit program, the relatively large volume that is required for an efficient operation due to substantial processing scale economies, and the reduced availability of market outlets due to the growth of fluid milk retailing through supermarkets.

Changes in the number of fully regulated handlers under selected Federal Order Markets are shown in Table 34. A downward trend is apparent in most markets. These data may underestimate the actual trend, due to (1) the expansion of many regulated marketing areas and (2) the expansion of distribution areas by some formerly unregulated handlers thus bringing these handlers under Federal Orders. Furthermore, handler enumeration is based upon the number of plants in the market and not the number of firms. Thus, a firm having two or more plants in a market is recorded as two or more handlers even though many of the firm's market decisions may be highly centralized. This is also applicable to handlers that operate facilities in more than one market. Each facility is recorded as an individual handler. However, many decisions may be highly coordinated presenting essentially one operational unit throughout the state. This coordinated action should be of concern to milk producers who are represented by many individual cooperatives in their dealings with handlers that have a highly centralized decision-making unit.

Tables 35 and 36 are highly significant in terms of presenting the changes and projections in the number of Ohio milk plants by size category. Between 1952 and 1962 there was a substantial decrease (35 to 75 per cent) in number of milk plants in all but one of the size categories. The exception was the largest category where the plant numbers increased 17 per cent. While the over-all reduction during this period exceeded 40 per cent, projections indicate that during the next decade there will be another 30 per cent reduction in the number of Ohio milk plants.

These data indicate quite vividly the substantial reduction in the number of market outlets (processor-buyers) for milk producers. In addition, the total volume of milk handled by fluid milk plants has increased and is likely to continue to increase, indicating the larger absolute size of these processing operations. As processor size increases, individual handlers become more important in terms of an outlet for producer milk and therefore producer cooperatives must be ready to furnish these larger processors with the desired supply and service.

Table 37 indicates that the market share of the four largest handlers has been surprisingly stable in many Federal Order markets. This indicates that the largest four have grown at about the same rate as total market sales.

Table 34
Number of Fully Regulated Handlers,
Selected Federal Order Markets

1950, 1956 and 1962

Market	Number of Handlers		
	1950	1956	1962
Cincinnati	37	35	32
Columbus	20	11	12
Dayton-Springfield	27	20	13
North Central Ohio	8	11	15
Northeastern Ohio	112	94	59
Toledo	11	13	12
Tri-State	27	31	28
Wheeling	--	28	20
Youngstown	--	--	13

Source: Federal Milk Market Statistics

Table 35
Number of Milk Plants and Percentage Change,
By Monthly Volume Handled,
Ohio, 1952 and 1962

Year	Plant Size: Less than 30,000 lbs per month	30,000-120,000 lbs per month	120,000-450,000 lbs per month	450,000-800,000 lbs per month	800,000- lbs per month	Total
1952	71	158	171	70	124	594
1962	22	38	109	36	145	350
% Change	-69.0	-75.9	-36.3	-48.6	+16.9	-41.1

Source: Eickhoff, W.D., Market Structure and Performance Relationships in the Ohio Fluid Milk Industry, Unpublished Ph.D. Thesis, The Ohio State University, 1963.

Table 36

Number of Milk Plants, 1952 and 1962, Estimated Number, 1972 and Equilibrium State, By Size Classification, Ohio

Year	Plant Size: Less than 30,000 lbs per month	30,000-120,000 lbs per month	120,000-450,000 lbs per month	450,000-800,000 lbs per month	800,000-lbs per month	Total
1952	71	158	171	70	125	594
1962	22	38	109	36	145	350
1972	12	13	57	23	142	247
Equilibrium	9	5	7	5	61	87

Source: Eickhoff W.D., Market Structure and Performance Relationships in the Ohio Fluid Milk Industry, Unpublished Ph.D. Thesis, The Ohio State University, 1963.

Table 37

Sales of Packaged Fluid Milk on Routes in the Marketing Area (as defined at that time) by the Four Largest Handlers (largest in terms of Sales in the area) As Percentage of Sales in the Marketing Area by All Types of Handlers (March of each Year)

	1950	1954	1956	1958	1960	1962
N. Central	54.3%	54.4%*	96.7%*	45.9%	55.7%*	57.5%
Cincinnati	56.4	52.3	53.1	51.3*	49.6*	47.8
N. Eastern				53.9*	45.4	43.4
Columbus	72.9	83.0	84.6	86.3*	77.1	76.4
Dayton-Springfield	58.9	66.2	61.8	70.3	77.2	83.0
Toledo 1/						
Tri-State		41.6*	36.3	44.7*	52.1	50.7

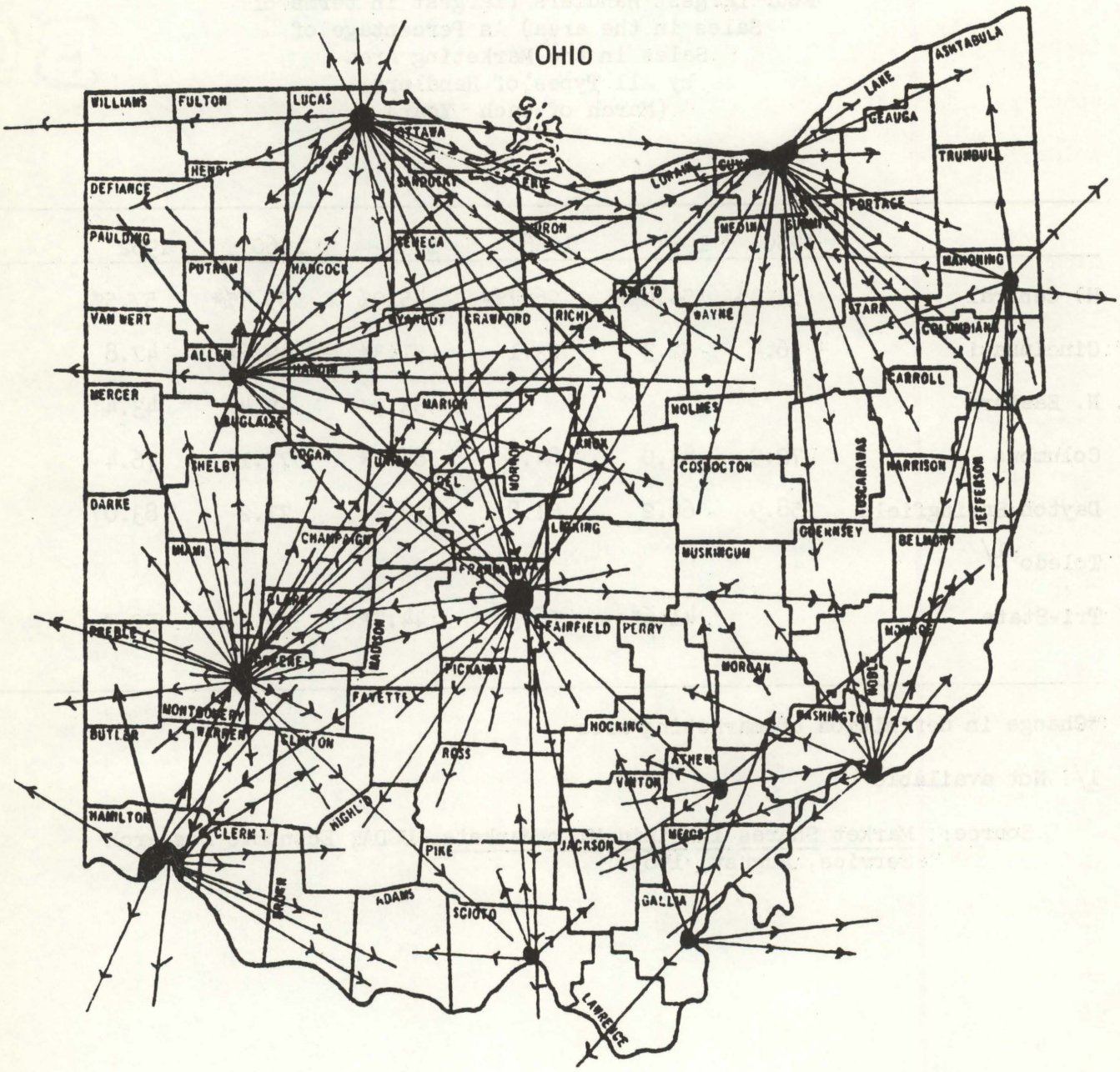
*Change in definition of marketing area

1/ Not available

Source: Market Shares in Fluid Milk Markets, USDA, Economic Research Service, August, 1963.

FIGURE 9

MOVEMENT OF PACKAGED MILK BY REGULATED HANDLERS TO VARIOUS COUNTIES, SEPTEMBER, 1963



Source: Managers of Dairy Cooperatives

-VII-

Definition of Milk Markets

The concept of a market is of increasing importance in the administration of the Agricultural Marketing Agreement Act of 1937 and is therefore of importance to dairy producers and processors alike. A market is defined as a sphere within which the price-making forces of supply and demand operate. The primary concern of this section is the geographical dimension of that sphere.

Under the legislation which provides for federal market orders, "...the marketing area is designed to include all of an area where the same milk dealers compete with each other for sales of milk, and where such milk must meet essentially the same sanitary inspection standards."[5/] This designation conforms to the economist's concept of a "relevant market", the smallest unit of competition which, if cornered, would limit marketing alternatives to other buyers and sellers. In general, the Act places some restriction on the legal definition of a market:

> "No order shall be issued...which is applicable to all production areas or marketing areas, or both, of any commodity of product thereof unless the Secretary (of Agriculture) finds that the issuance of several orders applicable to the respective regional production areas or regional marketing areas, or both, as the case may be, of the commodity or product would not effectively carry out the declared policy..."[6/]

Succeeding paragraphs, while directing the Secretary to recognize "differences in production and marketing..."[7/] in defining order market

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5/ Federal Milk Marketing Orders: Their Establishment, Terms, and Operations, Misc. Pub. No. 732 (Washington, D.C.: Dairy Div., AMS, USDA; Oct. 1956)

6/ Paragraph 608c (11) (A) of the Agricultural Marketing Agreement Act as cited in Compilation of Agricultural Marketing Agreement Act of 1937, Agricultural Handbook No. 124, (Washington, D.C.: AMS, USDA; Jan. 1, 1958) pp. 11-12.

7/ Ibid. Paragraph 608c (11) (C) p. 12.

areas, specifically exempt milk from the provision that

> "...orders...be limited in their application to the smallest regional production areas or regional marketing areas, or both, as the case may be, which the Secretary finds practicable..."8/

Thus, the Secreatry of Agriuclture could not provide for a national market order unless there were substantial reasons why orders for smaller regions could not fulfill the objectives of orderly marketing and an adequate supply of fluid milk. On the other hand, the Secretary is not bound, in the case of milk and milk products, to confine a specific order to the smallest practicable area. Rather, subject to consultation with interested parties, an arbitrary decision is within his power. It is a fact, however, that in the past, market order areas have largely adhered to the concept of a relevant market with respect to handler-consumer relationships.

One important factor in the determination of market boundaries was the difference between sanitary regulations in neighboring markets. Most major markets now have adopted sanitary standards modeled after the U.S. Public Health Service recommendations. In some cases, minor differences exist, if not in the regulations themselves, in their enforcement. These differences have doubtlessly impeded the free flow of milk between markets. Figure 9, however, has indicated that substantial movement of dairy products does, in fact, take place. The rather universal acceptance of the interstate shippers list is further evidence of the similarity of effective sanitary standards. As a result of these facts, the use of health department regulations, as a basis for the development of market definitions, is not as important as formerly.

In view of the growth of supermarket retailing of milk in recent years, as well as the substantial improvement in highway facilities, packaging,

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8/ Ibid. Paragraph 608c (11) (B)

transportation equipment, etc., the usefulness of the historical market definitions, even as amended through the hearing process, deserves study. Intermarket movement of packaged milk is a steadily growing phenomenon. Figure 9 indicated the extent of this movement in September, 1963. In view of this situation, the extent of dealer sales territories offers no clear-cut solution to the market delineation problem. The nearness of major population centers and the present and anticipated highway system have brought about intermarket relationships of a greater magnitude than the extent of actual milk movement indicates. Among large handlers, the potential for such movement influences the behavior of other handlers in each market. The nature of present milk distribution systems, mainly those of large store buyers, makes possible abrupt and substantial changes in the point of supply for a city's outlets. Many recent examples of this can be cited in Ohio. The threat of such movement thus makes intermarket relationships of increasing significance, whether actual movement takes place or not.

There are many who feel that raw product price alignment would eliminate intermarket movement of milk. While alignment is likely to reduce this movement, Table 38 indicates that price is by no means the sole or, perhaps, even the major determinant of such movement. Scale economies in processing and distribution, and long run price and sales expectations are also important. If a transportation charge of 1.5 cents per cwt. per 10 miles is added to the Class I price of milk moving between markets, it can be seen that the cost of raw product, plus transportation charges, to an exporting handler are at times higher than these same costs are to handlers located in the receiving market. On the other hand, there are instances where handlers could conceivable move milk profitably between markets, but no movement is made.

In light of these remarks, and the rather vague legal basis for market definition, it is pertinent to consider several formal methods of determining market boundaries. Such methods might provide an economically justifiable and concrete objective for groups involved in market order hearings.

One conceivable means of defining a market is based on the location of processors and their market areas. A three-stage process would provide the market definition in this case.

(1) Identify a principal city and all contiguous areas which are economically integrated with it.

(2) Extend the market boundaries to include areas where handlers within the region defined in (1) provide a significant portion of the milk supply or derive a significant portion of their total receipts.

(3) Repeat (2) with respect to the new "market" until there are no extensions to the market boundaries.

Another way of defining a market under the terms of the Agricultural Marketing Agreement Act of 1937 might be based on the location of producers and their market areas. The process that would be involved in this instance is:

(1) Identify a cluster of processors who draw product from the same milkshed with virtually no transportation differential with respect to their milkshed or to each other. These processors would be located in a principal city and nearby communities.

(2) Market boundaries are defined by the location of producers who derive a significant portion of their receipts from processors in the cluster just noted or by the location of producers who supply the cluster with a significant portion of its total demand.

(3) Extend the market boundaries to include clusters of processors served by producers in the milkshed defined in (2) according to the criteria designated there.

(4) Extend the market boundaries to include the procurement areas of the new cluster(s) according to the crietria in (2).

(5) Repeat (3) and (4) successively until there are no new extensions.

While they provide concrete means for defining a relevant market, the concepts implicit in the above procedures fall short, in theory, of the desirable scope of coverage. This statement is made in light of the fact that there can be considerable "intermarket movement" of milk between producer and processor in the first method and between processor and consumer in the second method. Either such movement must be audited and adjustments made or the goal of orderly marketing will not be fulfilled. If such movement is to be audited, who is the appropriate auditing body? This and other ticklish administrative questions can be elimirated and the goal of orderly marketing satisfied if "intermarket movement" of product at any level is mitigated.

The definition of a market which would provide for theoretical coherence and equitable policy is one which considers the entire channel of distribution of fluid milk--producers, processors, retailers, and consumers. This pre-supposes that all of these parties have an economic interest in market behavior at each level of the distribution channel and in the interregional relationships in the whole market. Differing intersts are resolved through central administration of the market order agreements with allowances for geographical differences.

A procedure for market definition which begins to comply with the above notions is the one suggested by the Nourse Committee[9/] in April 1962.

9/ This committee, composed of economists and representatives of a number of dairy trade associations, was commissioned by Secretary Freeman in 1961, to analyze and make recommendations concerning Federal Milk Marketing Orders.

(1) "Indentify the principal city whose milk supply and that of closely related distribution centers is to be priced by the order."

(2) "Determine the extent of the primary metropolitan market, including besides the hub city, its suburban areas and contiguous or adjacent urban centers that have strong economic and institutional ties to the principal city."

(3) "Trace the boundaries of the regular production area (determined by shipments and health department approvals) for the primary metropolitan market identified in (2)."

(4) "Locate all the principal urban centers that lie within the production area as determined in (3); extend the bounds of the primary metropolitan market as determined in (2) to embrace these urban centers and the intervening territory."

(5) "Trace the boundaries of the regular production areas for the urban centers identified in (4)."

(6) "Include areas which are regular markets for both producers and processors within the area defined by (3), (4), and (5)."

(7) "Repeat (5) and (6) until there are no further extensions." 10/

The procedure just outlined would have the following results:

(1) All handlers within the same competitive environment would be regulated under the same order and would operate within the same price structure.

(2) Returns to producers would be equalized.

(3) Uneconomic shipment patterns could be discontinued.

(4) Producers would be protected from wasteful competition both among processors and within their own ranks.

(5) The interests of consumers and the intent of the Act would be better served than under existing fragmentation.

Carrying out any of the suggested procedures for market determination would result in one market, the extent of which would approach that of the Continental United States. In the amended Nourse Committee recommendations, however, is a procedure which satisfies the criteria of equitability to

10/ Report to the Secretary of Agriculture by the Federal Milk Order Study Committee (Washington, D.C.: USDA, April, 1962), p. II-2-10,11.

all economically concerned parties and theoretical coherence with respect to price alignment and inclusion of all competing interests. Regardless of the procedure preferred (of the three suggested), however, the net result is approximately the same. Instances of partially regulated handlers, and arbitrary decisions regarding which order should regulate a specific handler would be eliminated.

While the above analysis is likely to satisfy the proponents of a national marketing order for fluid milk, neither a national order or its proponents consider the many institutional arrangements which have led to the present proliferation of separate orders. While the present arrangement is admittedly the arbitrary result of many compromises, theory too is ultimately arbitrary. The goal is to propose a market definition which, while not treading in a wholesale manner on the principal tenets of the theoretician, still recognizes the institutional forces that make up the economic facts of life. It is not particularly helpful, however, to satisfy oneself with the present arrangement.

An improved system of market orders would maintain price alignment and provide effective partial regulation. The boundaries of markets would depend upon the location of members represented by individual cooperatives, the location and ownership of cooperative-controlled surplus disposal facilities, the existence of unified producer support and of coordinated producer marketing programs, as well as the distribution patterns of handlers.

The consideration of these factors does not necessarily preclude the satisfaction of market participants' demands for equitability, but does result in a market order program which, while resolving most of the tensions associated with the present arrangement, satisfies the criterion of administrative workability. Market consolidations and extensions would take place,

but the real differences in marketing situations in various areas would be recognized. In Ohio, such a program might result in a single market including the present Northeastern Ohio, Youngstown-Warren and Toledo markets and intervening areas. Another might include the present Cincinnati, Dayton-Springfield and Columbus markets, as well as intervening territory. Further consolidations which may or may not include other order areas also appear feasible.

Whatever the eventual arrangement of market orders, marketing conditions are always changing. The producer cooperation necessary to effectively work within the notions mentioned in this section are a step toward adjusting our legal and economic institutions to the reality of changes that have already taken place. Future programs must take cognizance of the changes that are to come.

Table 38
Net Cost Advantage to Handlers Shipping Class I
Bulk Milk (cwt.) Between Ohio Markets

(Figures in parenthesis are transportation and handling charges, assumed to be $.015/cwt. for each 10 miles. Lower grid figures equal PR - (PS + T) where
PR = Class I price paid by local handlers in receiving market;
PS = Class I price paid by handlers in shipping market;
T = Transportation and handling charges from shipping market to receiving market. Positive figures indicate "profitable" shipments. Underlined grid figures indicate shipments being made in Oct. 1963)

Milk Shipped To:	Class I Price[1]	Milk Shipped From: Columbus $4.30	Cincinnati $4.77	Cleveland $4.51	Lima $4.22	Dayton $4.48	Youngstown $4.61	Athens $4.70	Toledo $4.38
Columbus	$4.30		(.16) -.63	(.21) -.41	(.14) -.06	(.10) -.28	(.25) -.56	(.11) -.51	(.19) -.27
Cincinnati	$4.77	(.16) +.31		(.36) -.10	(.19) +.36	(.08) +.21	(.42) -.26	(.22) -.15	(.30) +.09
Cleveland	$4.51	(.21) .00	(.36) -.62		(.23) +.06	(.30) -.27	(.10) -.20	(.28) -.47	(.17) -.04
Lima	$4.22	(.14) -.22	(.19) -.74	(.23) -.52		(.11) -.37	(.30) -.69	(.25) -.73	(.12) -.28
Dayton	$4.48	(.10) +.08	(.08) -.37	(.30) -.33	(.11) +.15		(.35) -.48	(.20) -.42	(.23) -.13
Youngstown	$4.61	(.25) +.06	(.42) -.58	(.10) .00	(.30) +.09	(.35) -.22		(.29) -.38	(.25) -.02
Athens	$4.70	(.11) +.29	(.22) -.29	(.28) -.09	(.25) +.23	(.20) +.02	(.29) -.20		(.31) +.01
Toledo	$4.38	(.19) -.11	(.30) -.69	(.17) -.30	(.12) +.04	(.23) -.33	(.25) -.48	(.31) -.63	

1/ Average 1962 Federal Order Class I prices (no premiums).

FIGURE 10

OHIO FEDERAL REGULATED FLUID MILK AREAS

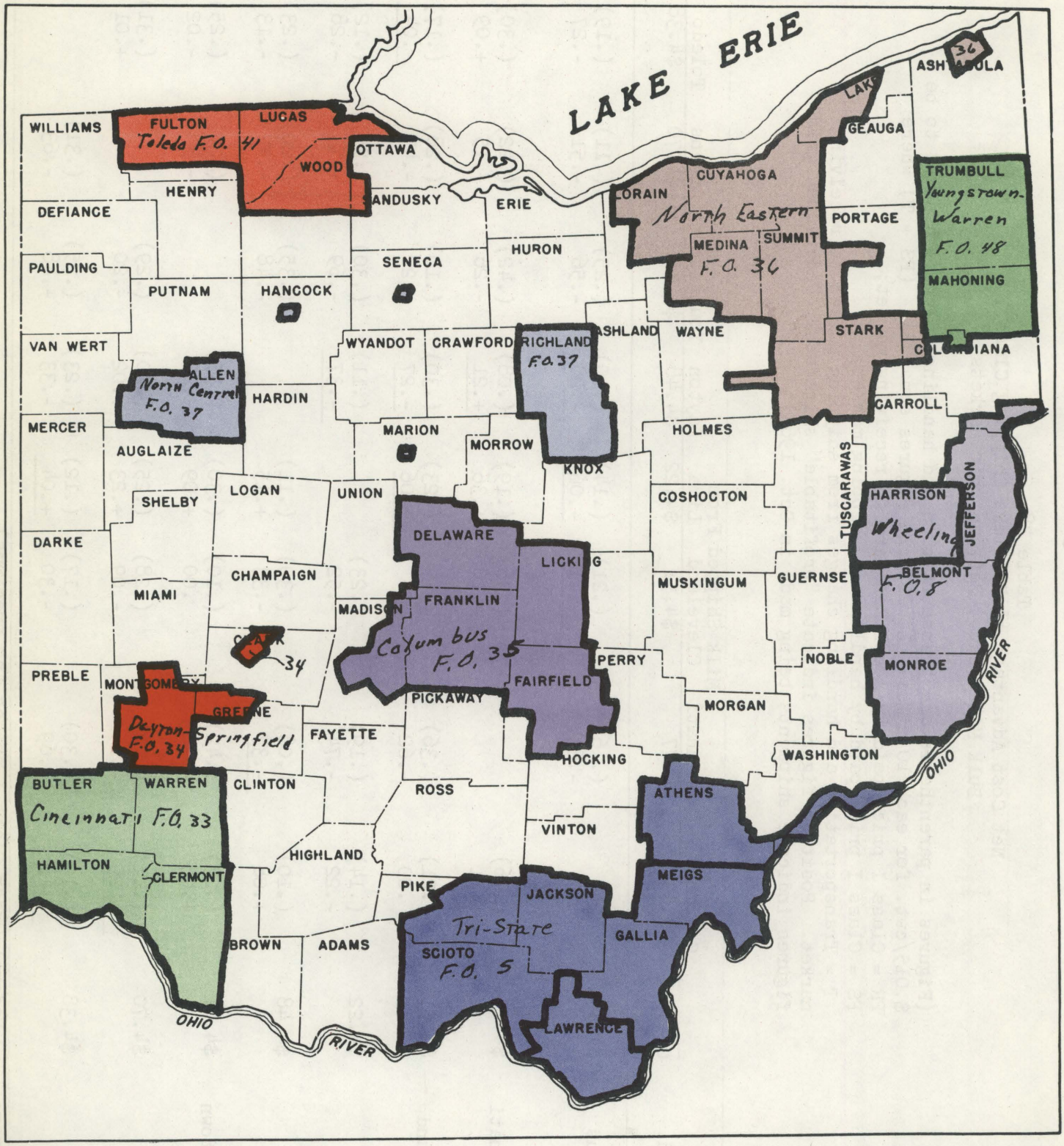

FIGURE 11

PRESENT AND PROPOSED HIGHWAYS

IN OHIO, JANUARY 1, 1963

Source: Ohio Department of Highways

Conclusions

The trends indicated in this report suggest that some increases in producer returns may result from changes in the structure of dairy marketing cooperatives. There is a need for much closer working relationships among Ohio's dairy marketing cooperatives if they wish to be most effective in increasing returns to producers. Cooperatives were originally organized to enhance the bargaining position of individual producers in their dealings with processors. In order to continue to meet this objective it is necessary to set up a cooperative structure that can deal effectively with current and future market conditions. It is no longer possible to define a market in very precise terms and, therefore, it seems necessary to change the scope of cooperatives to keep them up to date. Milk movement, both in bulk and in packaged form, has increased dramatically during the past ten years and indications point to even greater interrelations among markets in the decade ahead.

The extensive amount of milkshed overlap is evident in several places in this report. As a general rule, large volume producers have more market selection opportunities than do small producers. In addition to this increased supply area overlap, there is a considerable amount of sales area overlap.

Intermarket movements of milk are generally the result of 1) price differences between markets, 2) consolidations by processors, perhaps to take advantage of some scale economies, 3) outlet expansion by processors, or 4) competition among cooperatives for additional Class I outlets. It is significant that none of these reasons has as its objective increasing total Class I sales. The net result of most of these movements is a reallocation of the total Class I market. At best, the net result of these milk movements to producers is a shifting of Class I dollars from one producer to another.

It appears that some merging of present dairy cooperatives could better cope with the problems of the future. There are several major areas where such centralized activity could function effectively.

1. Most major markets in this state are regulated by Federal Orders. Greater uniformity in these order regulations might bring about more orderly marketing. Such order differences as seasonal incentive plans, pool plant qualifications, pooling procedures, classification of milk, and class prices are all of major importance to each market. With the present day ease of milk movement, variations in these features can quickly disrupt the orderly flow of products. Incomes to producers and returns to processors are affected significantly by such differences.
2. Currently, costs of raw products to processors are different in the various markets. Further, these price levels can be affected by procurement policies. Handlers procurement policies, in addition to affecting Class I price, also affects the Class I Utilization. Large firms with multi-plant operations can be expected to take full advantage of these conditions provided the possible savings outweigh the additional transportation and handling costs. This represents good business policy on their part and it is duplicated in many other segments of our economy. The real question, however, is whether or not it is good business strategy for dairy farmers to maintain cooperatives which compete against each other in this manner if their objective is the enhancement of returns from their milk.

While a certain marketing program may be of short run value to one group of producers, it may at the same time, be detrimental to some or all other groups in the state.

A more centralized approach would also be useful in determining unified market policy. For example, under the present arrangement the allocation of market supplies may be made at a disadvantage to producers. Under a different cooperative organization, market allocation might be made in such a manner as to better protect the interests of producers.

A structure of this sort is comparable to that which exists today among large corporate dairy processors and chain retail stores. In these industries, the larger firms have established regional offices which coordinate the firm's activities in a particular area. These firms are the major buyers from the dairy cooperatives. Thus it is essential that dairy farmers set up organizations that can deal effectively with such firms concerning the terms and conditions of sale. In every major market of this state at least one large corporate dairy processor is an important milk buyer. In addition, chain retail stores operate in all areas. The importance of these regional processors has increased significantly during the past decade and, assuming further decreases in processor numbers, their relative importance will increase.

3. Another important feature of the competitive environment is the degree of organization of milk producers in adjacent areas. These organizations are in a position to compete effectively for Class I

markets in Ohio. The individual cooperatives in this state are hard pressed to initiate programs in competition with those organizations, or to retaliate against programs which are detrimental to their interests.

4. Order changes are made through the public hearing process where all interested parties give testimony. Because of differing marketing programs and conditions, it is quite possible for different producer groups to offer conflicting testimony. With increased movement of milk, this situation may become increasingly important when three or four large cooperatives have producer members in several markets. It appears that federal order proposals and their presentation at hearings would better serve producers' interests if they were made by a central staff. This would assure the highest income to producers commensurate with sound marketing programs. While there is considerable cooperation among groups at present, and while theoretically at least, a unanimous meeting of the minds would assure a similar result, considering the factors involved, unanimity as a regular occurrence seems unlikely.
5. Although the marketing problems have been different in the various markets of this state during past years, this is much less likely to be the situation in the future. For this reason, the interests and responsibilities of producers are more nearly the same in all markets. The interests of producers have already been discussed in this report but producers also have some joint responsibilities. For example, several cooperatives have sizeable investments in facilities to process surplus milk. Large volumes are required to operate such facilities efficiently and, therefore, these facilities are associated with large markets. Smaller markets

can draw upon this supply when needed or dispose of excess supplies at these facilities. In this manner the brunt of the financial load is carried by producers in the large markets while many of the benefits accrue to all producers. It would seem reasonable, therefore, for all producers to share equally in the costs associated with the disposal of surplus milk from fluid markets.

6. Marketing services could be provided more efficiently by improved coordination and thereby could effect significant benefits for dairy farmers. For example, analysis indicates that the cost of transportation from farm to market can be reduced by avoiding much of the overlap that exists in milk procurement today. Savings could also result from a coordinated field service program, a testing and weighing service, and the solution of farmer problems which are similar form market to market.

7. There are some major cooperatives in this state that do not have sufficient outlets for excess milk. Cooperatives in this state own facilities to handle most of the volume of excess milk in Ohio markets at the present time. The problem, however, is one of coordinating diversion programs so that the markets are relieved of their excess supplies and so that facilities can be utilized as efficiently as possible. It seems reasonable that some improved cooperative arrangements could be set up to perform this function.

The operation of surplus facilities in this manner would necessitate changes in present Federal Order provisions. Under present order programs it would be possible to manipulate supplies in a market through the operation of facilities and thus affect

the supply-demand adjuster. It should not be the intent of this structural arrangement to manipulate market prices.

It is also necessary to evaluate the consequences of continuation with the present structure. The very fact that some rather serious problems exist among some Ohio dairy cooperatives today is but a prelude to what is likely in the future. Market interdependence will increase, not decrease, and it seems likely that under the present structure, dairy cooperatives will be forced into bitter competition. The effect of such competition which hinders the effectiveness of marketing programs, suggests that some structural changes are essential.

In order to facilitate a more consolidated cooperative structure, while several possible combinations exist it should be clear from the data presented in this report that any market delineation would be faced with inter-market movement problems. For this reason, Ohio producers might consider the merits of a statewide cooperative marketing organization. While movement does not and probably will not stop at state lines, the existence of large fluid markets and the presence of an existing federation makes this alternative attractive.

It should be noted, however, that there are disadvantages connected with merging. For example, E.M. Babb and H.L. Moore indicate the following:

> "Cooperative management, directors and members should carefully consider the possible benefits of consolidation, but they should also be aware of certain disadvantages of consolidation. Producer members of all the consolidating cooperatives may not receive exactly the same degree of improvement from each of the various advantages of merger. Some of the possible disadvantages which should be considered include loss of identity, communications, personnel problems and loss of local interests."*

Further study of the relationships among Ohio and out-of-state markets

* "Should Marketing Cooperatives Consolidate?" Babb, E.M. and Moore, H.L., Economic and Marketing Information for Indiana Farmers, August 30, 1963.

is necessary before regional organizations are dismissed as a possibility. On the other hand, the close relationships that already exist among some of the Ohio cooperatives provide an atmosphere in which consolidation is more likely to take place. Long run considerations, however, should precede planning and decisions related to reorganizing the cooperative structure.

The loss of identity through merger is somewhat distasteful to many closely associated with the cooperatives. In many instances, however, these identification features are more closely associated with the management and Boards of Directors than they are with the membership. The basic objectives of the members of dairy marketing cooperatives are almost identical in all markets. It is, therefore, good business strategy to develop a structure of cooperatives that will enable the fulfillment of the basic objectives of the organization.